

# MEDICINAL PLANTS

AND

## THEIR CULTIVATION IN CANADA

By JOHN ADAMS, M.A.,  
ASSISTANT DOMINION BOTANIST

DOMINION OF CANADA  
DEPARTMENT OF AGRICULTURE  
BULLETIN No. 36—NEW SERIES

DIVISION OF BOTANY  
DOMINION EXPERIMENTAL FARMS



Agriculture  
Canada

Canadian Agriculture Library  
Bibliothèque canadienne de l'agriculture  
Ottawa K1A 0C5

630.4  
C212  
B 36  
n. s.  
1927  
c. 2

Reprinted by direction of the Hon. W. R. Motherwell, Minister of Agriculture,  
Ottawa. Reprinted 1927



# DOMINION EXPERIMENTAL FARMS BRANCH

## PERSONNEL

DIRECTOR, E. S. ARCHIBALD, B.A., B.S.A.

Dominion Field Husbandman.....	E. S. Hopkins, B.S.A., M.S.
Dominion Chemist.....	Frank T. Shutt, M.A., D.Sc.
Dominion Horticulturist.....	W. T. Macoun.
Dominion Cerealists.....	L. H. Newman, B.S.A.
Dominion Botanist.....	H. T. Güssow.
Dominion Animal Husbandman.....	G. B. Rothwell, B.S.A.
Dominion Forage Crop Specialist.....	G. P. McRostie, B.S.A., Ph.D.
Dominion Poultry Husbandman.....	F. C. Elford.
Chief, Tobacco Division.....	C. M. Slagg, M.S.
Dominion Apiarist.....	C. B. Gooderham, B.S.A.
Dominion Bacteriologist.....	Grant Lochhead, Ph.D.
Chief Officer, Extension and Publicity.....	F. C. Nunnick, B.S.A.
Chief Supervisor of Illustration Stations.....	John Fixter.
Economic Fibre Specialist.....	R. J. Hutchinson.

## ALBERTA

Superintendent, Experimental Station, Lacombe, Alta.,	F. H. Read, B.S.A.
Superintendent, Experimental Station, Lethbridge, Alta.,	W. H. Fairfield, M.Sc.
Superintendent, Experimental Sub-station, Beaverlodge, Alta.,	W. D. Albright.
Superintendent, Experimental Sub-station, Fort Vermilion, Alta.,	Robt. Jones.

## BRITISH COLUMBIA

Superintendent, Experimental Farm, Agassiz, B.C.,	W. H. Hicks, B.S.A.
Superintendent, Experimental Station, Summerland, B.C.,	W. T. Hunter, B.S.A.
Superintendent, Experimental Station, Invermere, B.C.,	R. G. Newton, B.S.A.
Superintendent, Experimental Station, Sidney, B.C.,	E. M. Straight, B.S.A.

## MANITOBA

Superintendent, Experimental Farm, Brandon, Man.,	M. J. Tinline, B.S.A.
Superintendent, Experimental Station, Morden, Man.,	W. R. Leslie, B.S.A.

## SASKATCHEWAN

Superintendent, Experimental Farm, Indian Head, Sask.,	W. H. Gibson, B.S.A.
Superintendent, Experimental Station, Rosthern, Sask.,	W. A. Munro, B.A., B.S.A.
Superintendent, Experimental Station, Scott, Sask.,	Victor Matthews, B.S.A.
Superintendent, Experimental Station, Swift Current, Sask.,	J. G. Taggart, B.S.A.

## NEW BRUNSWICK

Superintendent, Experimental Station, Fredericton, N.B.,	C. F. Bailey, B.S.A.
--	----------------------

## NOVA SCOTIA

Superintendent, Experimental Farm, Nappan, N.S.,	W. W. Baird, B.S.A.
Superintendent, Experimental Station, Kentville, N.S.,	W. S. Blair.

## PRINCE EDWARD ISLAND

Superintendent, Experimental Station, Charlottetown, P.E.I.,	J. A. Clark, B.S.A.
--	---------------------

## ONTARIO

Central Experimental Farm, Ottawa, Ont.	
Superintendent, Experimental Station, Kapuskasing, Ont.,	S. Ballantyne.
Superintendent, Experimental Station, Harrow, Ont.,	H. A. Freeman, M.Sc.

## QUEBEC

Superintendent, Experimental Station, Cap Rouge, Que.,	G. A. Langelier, D.Sc.A.
Superintendent, Experimental Station, Lennoxville, Que.,	J. A. McClary.
Superintendent, Experimental Station, Ste. Anne de la Pocatière, Que.,	J. A. Ste. Marie, B.S.A.
Superintendent, Experimental Station, La Ferme, Que.,	P. Fortier, Agr.
Superintendent, Experimental Station, Farnham, Que.,	J. E. Montreuil, B.S.A.

# CHAPTER I

## Introduction

Formerly certain drug-plants growing wild in Canada and the United States were collected in sufficient quantity to supply the demand for them, without any care being taken to perpetuate the species by seeds or cuttings. The inevitable result was that eventually they became so scarce that great difficulty was experienced in obtaining them. This was true of such species as *Senecio Canadensis* and *Golden Seal*. In some localities the wild plant was almost exterminated, and it became evident that in order to meet the future demand certain drug-plants must be cultivated or cared for like any other field crop.

Before attempting the culture of drug-plants there are some preliminary considerations that should be carefully attended to by all who wish to make their cultivation a success. A knowledge of the soil and climate are essential, the question of cost of production has to be borne in mind. As the total quantity used in commerce is usually small, the quantity raised, it is evident that the area devoted to their growth on a single farm will also be small, and a plan will have to be largely used.

## CONTENTS


	PAGE
Chapter I. Introduction.. . . .	3
“ II. Soil, climate and cultivation.. . . .	4
“ III. Collection and drying.. . . .	5
“ IV. Explanation of terms.. . . .	6
“ V. Medicinal plants for which there is a considerable demand..	8
“ VI. Medicinal Plants used in moderate or small quantities.. .	19
Literature on Medicinal Plants.. . . .	27
Index.. . . .	29

market for them even if the price should not be as high as that of the wild, or failing a market, he can find his produce no less marketable elsewhere. It is a few years of drug-plants for which there is no demand and only be thrown on the market heap.

As the cost of labour is much lower in some European countries than in Canada, it is extremely doubtful whether certain drugs can be grown here at a profit. And it must be borne in mind that many drug-plants will only begin to give a return two or three, or in the case of others, several years after planting. In the case of a highly priced drug if a large number of farmers devoted a considerable area to its culture, over-production will result and the price will fall and disappointment will be inevitable.

Unless a farmer can otherwise succeed that he can realize larger profits per acre than the growth of drug-plants than from the usual farm produce, he would be wise not to attempt it unless as a sort of subsidiary means of supplementing his income. In any case, he can run no risk by devoting a small plot of about an acre to drug-culture as an experiment for a few years, and he should grow about ten different sorts of those best suited to his locality. As time goes, over-production and depreciation is certain and he will not regret that he is the same extent.





Digitized by the Internet Archive  
in 2013

## CHAPTER I

### Introduction

Formerly certain drug-plants growing wild in Canada and the United States were collected in sufficient quantity to supply the demand for them without any care being taken to perpetuate the species by seeds or otherwise. The inevitable result was that eventually they became so scarce that great difficulty was experienced in obtaining them. This was true of such species as Seneca Snake-root and Golden Seal. In some localities the wild plant was almost exterminated, and it became evident that, in order to meet the future demand, certain drug-plants must be cultivated or cared for like any other field crop.

Before attempting the culture of drug-plants there are some preliminary considerations that should be carefully attended to by all who wish to make their cultivation a success. Assuming that both soil and climate are suitable, the question of cost of production has to be borne in mind. As the total quantity used in commerce of many drug-plants is comparatively small, it is evident that the area devoted to their growth on a single farm will also be small, and hand labour will have to be largely used.

"In many of the processes connected with drug-plant culture much hand work is unavoidable. In picking leaves, seeds, and fruits, in digging certain types of roots and preparing them for market, and in grading and sorting the products, hand work is necessary" (R. H. True, 1903). The process of drying must be very carefully attended to, requiring much hand labour, and raising the cost. In reckoning up the cost of production, the expenses of packing and freight to the nearest market must also be considered.

As the total amount used in commerce of some drug-plants is comparatively small, it may easily happen that if more than this amount is produced by the growers or collectors, the price may fall so low that there is no margin for profit left. Indeed it might happen that a farmer would have a consignment left on his hands without getting a single offer for it if the buyers were already fully stocked, and few drug-plants can be held over without a marked deterioration until the following year. On the other hand, if a farmer produces a few acres of oats, or potatoes, or peaches, he can generally find a market for them even if the price should not be all that he could wish, or, failing a market, he can feed his produce to live stock or otherwise dispose of it. But a few tons of drug-plants for which there is no demand can only be thrown on the manure heap.

As the cost of labour is much lower in some European countries than in Canada, it is extremely doubtful whether certain drugs can be grown here at a profit. And it must be borne in mind that many drug-plants will only begin to give a return two or three, or, in the case of shrubs, several years after planting. In the case of a highly priced drug, if a large number of farmers devote a considerable area to its culture, over-production will result and the price will fall, and disappointment will be inevitable.

Unless a farmer can convince himself that he can realize larger profits per acre from the growth of drug-plants than from the usual farm products, he would be wiser not to attempt it unless as a sort of subsidiary means of supplementing his income. In any case, he can run no risk by devoting a small plot of about an acre to drug-culture as an experiment for a few years, and he should grow about ten different sorts of those best suited to his locality. In that case, over-production and depreciation in price in any one line will not affect him to the same extent.



In this connection, the following remarks from a recent paper by Dr. Stockberger, of the Bureau of Plant Industry at Washington, are most apt—

“The widespread interest in the possibility of growing medicinal plants for profit which has been developed in this country during the past decade has been capitalized by a number of crafty promoters, who use the mails and the columns of journals and magazines to disseminate flamboyant advertisements of the enormous profits which may be made by growing certain medicinal plants. Frequently the name of the plant is withheld until the victim has remitted from one to five dollars, for which he receives practically valueless instructions for the cultivation of some plant poorly adapted to our economic conditions.. I also have abundant evidence that hundreds of persons have received the impression that drug-crops can be grown by anybody anywhere at a profit far in excess of that to be obtained from ordinary cultivated crops. I am convinced that in some cases optimism and enthusiasm have been allowed to outrun common sense, but, if, in the future, due consideration is given to the fundamental principles of agricultural economics, I believe that a rational attitude toward commercial drug-plant cultivation may be developed.”

## CHAPTER II

### Soil, Climate, and Cultivation

Ordinarily a soil that is adapted for farm or garden crops may be expected to give similar results when drug-plants are grown on it, but there are exceptions. Plants such as Golden Seal that naturally grow in leaf-mould under the shade of forest trees, cannot be grown successfully if exposed to full sunlight, nor will Peppermint be a success if grown in a dry, sandy soil that might be suitable for some other crop.

In the case of certain annual plants, such as Anise, it is probable that they could be grown even in localities where the winter is very severe, provided that they can ripen their seeds before the first autumn frost. The plant just mentioned belongs to the same family as the parsley and carrot, and the germination of the seeds is slow. Early sowing in such cases would, therefore, be necessary, and possibly still better results would be obtained by sowing the seed in late autumn before the ground freezes.

As regards Golden Seal and other plants of the forest, the best results can only be obtained by growing the plants in partial shade. This is accomplished by making artificial screens out of laths fastened horizontally to vertical supports and leaving a space between each two laths. Probably it would be much cheaper to clear a space in the forest of all other herbaceous plants and grow the Golden Seal there under natural conditions. Or it might be possible to grow it in rows under the trees in an old orchard.

In growing any of the plants mentioned in this bulletin, the best method is to place the plant in soil and conditions resembling as closely as possible those in which it grows in a wild state. Only by so doing will the best results be obtained. As far as is known, the natural habitat of each species is indicated. The seeds of perennial herbs should be sown thinly on a specially prepared seed-bed in autumn. The young plants can be afterwards set in the ground provided for them, the work of transplanting being carried out as far as possible in rainy weather.

In the case of a considerable number of the drug-plants mentioned it will be very difficult to obtain seeds or roots for propagation, as the regular seedsmen and nurserymen do not stock them. Especially will this apply to European species.



With regard to the shrubs and trees which are used medicinally, it is extremely probable that, with the exception of Sacred Bark and a few others, these occur at present in sufficient quantity in the wild state to satisfy the demand. Considering the number of years that would elapse before they yielded any return, it is very unlikely that their cultivation on land suited for farm crops would be worth the trouble.

As some drug-plants are very poisonous, great care should be taken to prevent children and live stock from eating them.

### CHAPTER III

#### Collection and Drying

The prospective grower of drug-plants must be very careful in finding out whether he has the right species of plant to start with. In the case of seeds or roots obtained from a seedsman or nurseryman, the species can generally be depended on as true to name. But where a grower obtains his first stock of plants by digging up wild species, he should compare the plant carefully with the descriptions and illustrations given in the present bulletin and, if at all uncertain, he should send specimens (including leaves, flowers, and fruits, and in the case of herbs, roots also) to the Dominion Botanist, Ottawa, in order to make sure of the correct names.

Having got the proper species of plant, the next matter claiming attention is to find out what part of the plant is used in medicine. In some cases the root only is used; in others the leaves, or bark, or fruit, and care should be taken to exclude any other part of the plant other than that prescribed, as such accidental admixtures will undoubtedly lower the selling price.

In the case of roots or underground parts of plants, the soil should first be loosened with a fork, and the root should be dug up carefully, so as not to injure it or break it, thereby leaving part of it in the ground. They must then be gently but carefully washed and should be dried as quickly as possible at a moderate temperature.

The time of collection of drug-plants is most important, as the composition of the plant and the exact amount of the active principle present vary at different periods of the year. Directions are given in each case as to the proper time of collection, but the following general statements may be made here:—

Roots of biennial plants should be dug in the autumn of the first year, and those of perennial plants in the autumn of the second or later years of their growth. In some cases the collection may be made very early in spring before growth begins.

Underground stems or rhizomes should be collected at the same time of the year as perennial roots.

Barks should be collected in spring, when the sap begins to flow, but the process may be carried out at any time during the winter. It will be more difficult, however, to detach the bark at that time of year. As that part of the root or branch above the region where the bark is peeled off will die, it would be simpler to cut down the whole tree or saw off a limb, and the process of stripping the bark could be done under cover. In some cases the bark will come off more easily if previously pounded with a mallet. In some trees, such as wild black cherry, the outer bark must first be shaved off, or "rossed," only the inner bark being official. In Burning bush, it is the bark of the root only which is used.

Leaves should, as a rule, be collected when the plant is in flower, and only the healthy green leaves should be chosen.

Where the whole green plant or herb is used, the older thick stems should be rejected, and only the younger branches, flowers, and leaves taken.



Flowers should be collected just after they open, and before they begin to wither.

Fruits are, unless otherwise directed, gathered when ripe.

Seeds should be collected when ripe and just before the seed-vessels split or open. In the case of some plants that have numerous small seeds ripening in succession, such as Caraway, a branch should be cut as soon as the majority of the seeds on it are ripe.

Most drugs are purchased by the dealer in the dried condition, and the process of drying must be very carefully attended to. In warm, dry weather the plants should be spread out in thin layers in the open air, but they should not be exposed to direct sunlight, being put under cover at night to protect them from rain and dew until quite dry; or they may be spread on the clean floor of a barn and turned frequently. In the autumn and during rainy weather they will require to be dried by artificial heat, which can readily be done in a special drying shed with shelves, or in a greenhouse. Larger roots may be sliced lengthwise before drying. Three weeks or longer will be necessary for drying some species, according to the weather conditions and the time of the year. The plants should be dried in such a way as to retain, as far as possible, their natural colours. When thoroughly dry they will usually break quite readily. Unless the drying is carefully and thoroughly done, the whole crop may be ruined by the growth of various moulds.

Before collecting drug-plants a sample should be sent to the buyer, giving the name of the plant or drug and ascertaining what quantity will be purchased, and the price. If there is no market, perennial herbs and shrubs can be left in the ground till next season. Annuals and biennials which cannot be held over must be got rid of even if the price should not be quite satisfactory.

Some of the larger drug manufacturers grow the plants required by them for making medicines and are thus independent of supplies from outside sources. It might be possible for certain farmers in the neighbourhood to make an arrangement with some of these drug-firms for growing certain species required by them.

## CHAPTER IV

### Explanation of Terms

In the description of plants used for medicine given in Chapters V and VI the popular English or American name is first given, followed by the scientific or Latin name. This Latin name of the plant is always double and is followed by the name (often contracted) of the person who applied it. Following the scientific name is the name of the "family" to which the plant belongs.

The particular part of the plant used—root, leaf, etc.—is next given, and the name of the drug as used in the Pharmacopœia of the United States (indicated by U.S.), and the British Pharmacopœia, 1898 edition (indicated by B.P.).

The time of collection, so far as known, is given, followed by a description of the plant and, in some cases, by a figure. In the descriptions, a certain amount of botanical knowledge will be necessary to understand the terms used, although simple language has been employed as far as possible. The following brief definitions may be useful to enable those who may read this bulletin to understand the terms employed. A reference to the illustrations will make the meaning clearer:—

A *herb* is a plant in which the erect green stem lives for one season only and then lies down. Herbs are divided into three groups:—

(1) *Annual herbs* complete their whole life-history from seed to seed again inside one year or less, and then die. Black Mustard is an example.



(2) *Biennial herbs* usually produce a crown of leaves close to the ground and one or more thick roots during the first year. In the second year they form an erect stem, which produces seeds, and then the whole plant dies. Caraway is an example.

(3) *Perennial herbs* grow for many years and send up new shoots each year from some part of the plant underground, as Golden Seal and Peppermint.

*Shrubs* and *trees* have usually a taller stem than herbs, which grows in thickness year after year, forming rings of wood. They have usually winter buds. Witch Hazel is an example.

A *rhizome* is a creeping, underground stem with small scales, which represent leaves, and roots arising from it at intervals, as in May Apple.

Leaves are *sessile* when they have no stalks, as in Seneca Snakeroot.

Leaves are *simple* when the whole leaf is in a single piece, as in Peppermint.

When the broadest part of a leaf is nearest the base, it is *ovate*, as in Peppermint, but, when the broadest part is nearest the apex, it is *obovate*, as in Bearberry.

When the edge of a simple leaf is not indented in any way, but is a regular, continuous curve, the leaf is said to be *entire*, as in Balsam Fir.

When the edge is notched like the teeth of a saw, the leaf is *toothed*, as in Wild Black Cherry.

When a leaf is more deeply notched, it is *lobed*, and then the lobes may occur along two sides of the central axis or midrib, as in Black Mustard, where it is *pinnately lobed*, or the lobes may radiate outwards from a central point when the leaf is *palmately lobed*, as in Golden Seal.

A *compound* leaf is divided into several segments or leaflets which are mostly of the same shape. When there is an odd leaflet at the end, the others being in pairs, it is *unequally pinnate*, as in Sumac.

As regards their position on the stem, leaves may occur singly, when they are said to be *alternate*, as in Black Mustard, or they may be in pairs, when they are *opposite*, as in Mint; or they may be in a circle, as in Juniper.

The term *inflorescence* refers to the way in which the flowers are grouped around the central axis or stem.

A *raceme* consists of stalked flowers arranged around a long central axis, as in Wild Black Cherry.

A *spike* has the flowers similarly arranged, but they are without stalks, as in Seneca Snakeroot.

A *simple umbel* consists of stalked flowers springing from a central point.

A *compound umbel* has the simple umbels attached to the ends of radiating branches, as in Caraway.

A *head* consists of unstalked flowers closely set together with a series of bracts underneath, as in Chamomile.

A *flower* in the higher plants consists of four distinct parts:—

(a) A *calyx*, usually green in colour, formed of separate or united parts called *sepals*.

(b) A *corolla*, usually brightly coloured, formed of separate or united parts called *petals*.

(c) *Stamens*, consisting of a stalk and an expanded top part, which contains the fertilizing dust or pollen.

(d) *Carpels*, which may be separate or united, and which afterwards form the fruit. They are separate in Golden Seal, united in Jimson Weed.

Sometimes carpels or stamens are absent, the former being known as "*staminate flowers*," the latter as "*carpellary flowers*," as in Hop. Frequently the corolla is absent, as in Slippery Elm.

An *indehiscent* fruit is one which does not open when ripe, as in Dandelion.



A *capsule* is a dry fruit which splits when ripe to allow the seeds to escape, as in Thornapple.

A *berry* is a fleshy fruit which usually contains many small seeds.

A *drupe* or stone-fruit is a fleshy fruit which contains one or more seeds, each enclosed in a hard covering or stone, as in Wild Black Cherry.

Following the description of the plant, its distribution in Canada is given, and the nature of the situation in which it grows.

The number of species of plants that were formerly used in medicine is very large, and in addition to those mentioned in the following pages, there is a considerable number of others, natives of Canada, the names of which will be found in the drug-merchants' catalogues. They are sold in small quantities, and probably would hardly pay the cost of collection.

The uses to which various drugs have been put have not been mentioned in this bulletin. A considerable number of drug plants are poisonous, and, if their use was mentioned it would be necessary to state the dose and method of preparation. In the hands of inexperienced persons, this might lead to fatal results, and consequently the medicinal application of drug-plants had better be left to a skilled physician.

## CHAPTER V

### Medicinal Plants for Which There is a Considerable Demand

Some of the plants mentioned in this chapter are either natives of Canada or have escaped from cultivation, and now reproduce themselves by self-sown seed in the same manner as native species. The distribution of each species in Canada is briefly indicated.

**Golden Seal.** *Hydrastis canadensis* L. (Fam. RANUNCULACEAE). The dried rhizome yields *Hydrastis* (U.S.) and *Hydrastis Rhizoma* (B.P.). It is collected in autumn after the seeds have ripened.

Perennial herbs with thick, yellow rhizome. Stem leafy, hairy, a foot high with alternate leaves, which are three in number, one basal and two borne at the top of the stem. Leaves palmately lobed, the segments toothed. The basal leaf is 5 to 8 inches broad. Flower solitary, terminal, greenish-white. Sepals 3, Petals none, stamens numerous. Carpels numerous, each forming a crimson berry with one or two seeds when ripe, the cluster resembling a raspberry. Flowers in April. Fruit ripe in July or August, not poisonous, and eaten by birds (Fig. 1). Native in woods in Ontario. Golden Seal must be cultivated in shade like Ginseng. The seeds should be washed out and sown as soon as ripe. If they are allowed to become dry, they will not germinate. It takes five years from the time of sowing the seed until the rhizomes are ready for market, but it may be propagated by the division of old rhizomes. About two hundred tons are sold annually. Under good management, a ton of dried root may be expected per acre. Price in 1920, \$5 to \$6 per pound.

**White Mustard.** *Sinapis alba* L. (Fam. CRUCIFERAE). The ripe seeds furnish *Sinapis alba* (U.S.) Annual herbs 1 to 2 feet high, covered with stout hairs. Leaves alternate, pinnately lobed, the lower ones 6 to 8 inches long, with irregular toothed segments. Flowers in racemes, yellow. Sepals 4, petals 4, separate, stamens 6. Fruit, a long pod covered with bristles, having a flat sword-shaped beak, which frequently contains a single seed. The fruit opens, when ripe, by two valves falling away and leaving a central partition and the beak. Seeds yellow. Flowers all summer. It is a native of Europe, but has escaped from cultivation in Canada and occurs in fields and waste places. (Fig. 2.) The seeds of this and the following species when ground and mixed, constitute the Mustard of commerce.



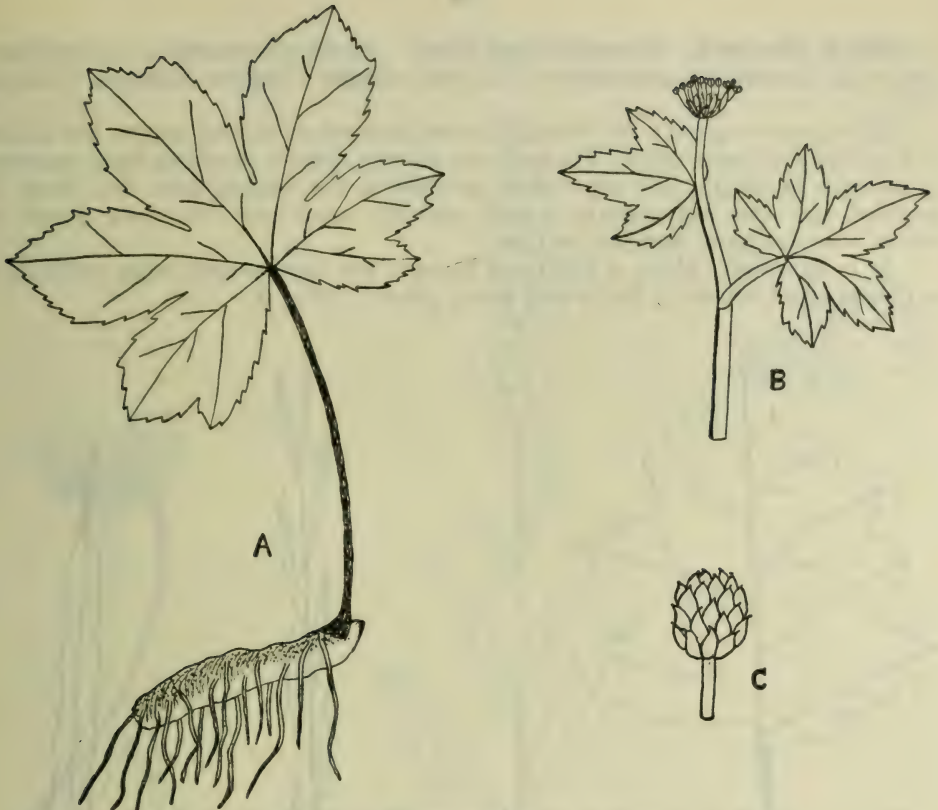


Fig. 1.—Golden Seal: A, Rhizome and leaf; B, Flower; C, Fruit.

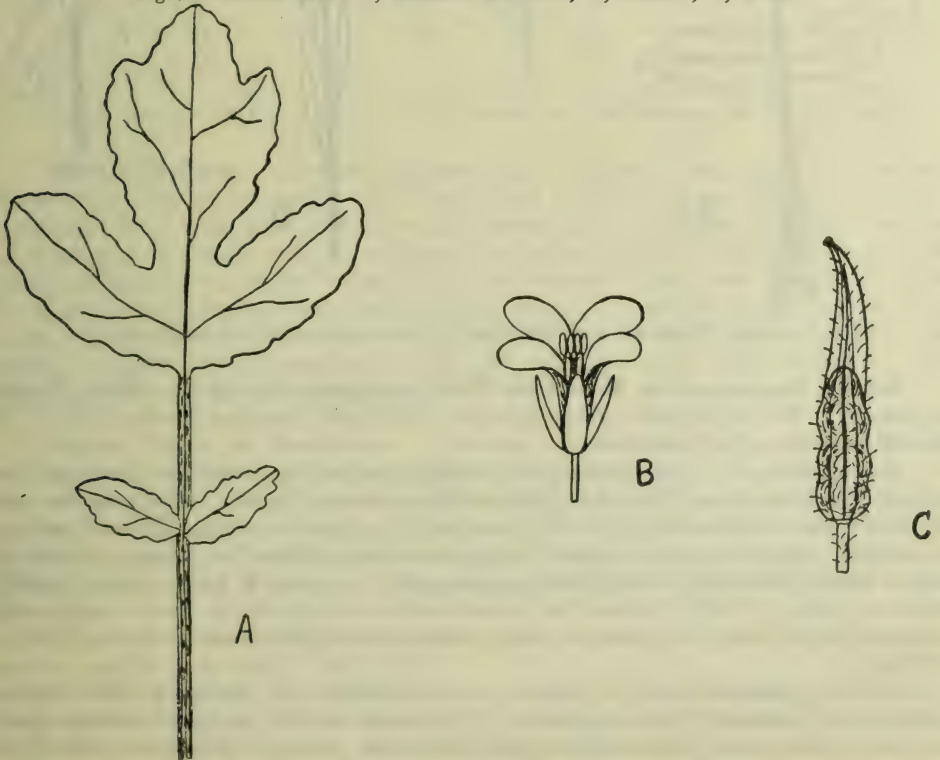


Fig. 2.—White Mustard: A, Leaf; B, Flower; C, Fruit.



**Black Mustard.** *Brassica nigra* Koch. (Fam. CRUCIFERAE). The dried ripe seeds furnish *Sinapis nigra* (U.S.) and *Oleum Sinapis Volatile* (U.S. & B.P.).

This species agrees with White Mustard in most of its characters, but differs in the following particulars: The pods are shorter, barely reaching three-quarters of an inch in length, and are closely pressed to the central axis; the beak is rounded and does not contain a seed, and the seeds are very dark purple in colour, and are more pungent in taste.

It is an annual plant, a native of Europe, but has escaped from cultivation in Canada and occurs in fields and waste places. (Fig. 3.)

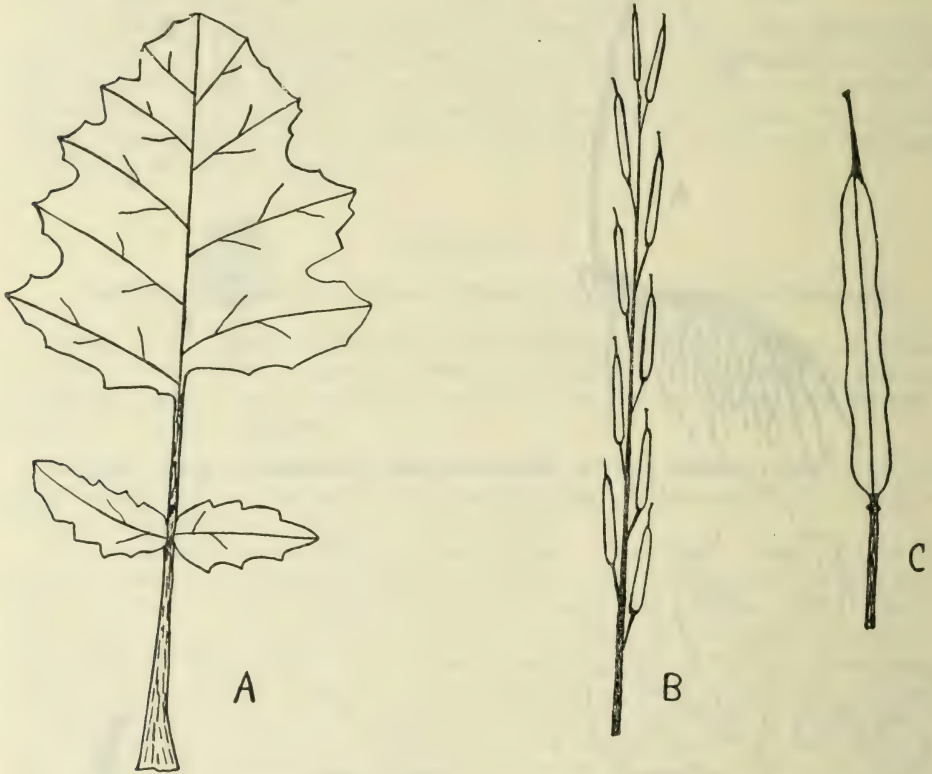


Fig. 3.—Black Mustard: A, Lower leaf; B, Group of fruits; C, single fruit.

**Seneca Snakeroot or Mountain Flax.** *Polygala Senega* L. (Fam. POLYGALACEAE). The dried root yields *Senega* (U.S.) and *Senegae Radix* (B.P.) It should be collected in autumn.

Perennial herbs, with several leafy stems proceeding from the crown of the rootstock. Stem 6 to 12 inches high, with alternate leaves. The leaves are without stalks, lance-shaped, faintly toothed, 1 to 2 inches long. Flowers, white, in a spike. Sepals 5, two of them being much larger than the others. Petals 3, united into a tube which is split along one side. Stamens 8, more or less united with the petals. Fruit a two-celled capsule with a single hairy seed in each cell. Flowers May-June. It grows in rocky woods from New Brunswick to Alberta (Fig. 4).

Seneca Snakeroot can be grown in soil suitable for ordinary field crops. Shade is not necessary for its growth. The plants should be set 15 inches apart in rows of the same width. Seedlings should be covered with straw the first



winter to protect them from frost. About four years will be required to produce roots of marketable size. The price in 1920 was 90 cents per pound.

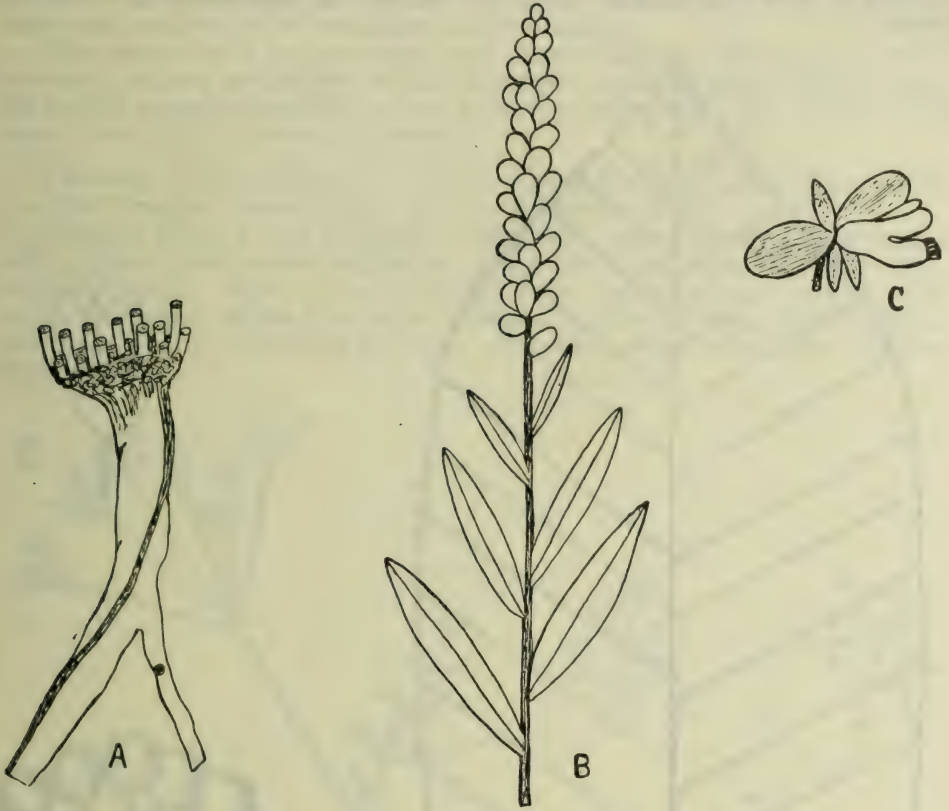


Fig. 4.—Seneca Snakeroot: A, Root; B, Leaves and inflorescence; C, Single flower.

**Marsh Mallow.** *Althaea officinalis* L. (Fam. MALVACEAE) The root deprived of the brown corky layer and dried yields *Althaea* (U.S.). It is a perennial herb with pink flowers which occurs in a wild state on salt marshes in Europe. It grows well in ordinary garden soil and might succeed in those parts of Canada where the winter is not too severe. A space of three feet should be allowed between the rows and the plants should stand 16 inches apart in the rows. The roots are harvested at the end of the second year of growth. As much as 800 to 1,000 pounds of dry root per acre have been obtained. The price in 1920 was 25 cents per pound.

**Sacred Bark or Bearberry.** *Rhamnus Purshiana* D.C. (Fam. RHAMNACEAE). The dried bark collected from June to August, at least one year before being used, yields *Rhamnus purshiana* (U.S.) and *Cascara sagrada* (B.P.). A small tree 15 to 20 feet high, with alternate leaves. The leaves are two to six inches long, toothed, with prominent veins. Flowers greenish, in small clusters. The stamens stand in front of the petals. Fruit an ovoid, black, three-seeded berry.

It occurs in moist situations in the mountains of British Columbia, and grows readily from seed. (Fig. 5.)

The seeds should not be allowed to become dry before sowing. The one-year-old seedlings should be set out in their permanent position about 6 feet apart each way. The young trees should be trained so as to have several long

principal branches springing from near the ground level. When the trees are mature only one of these branches should be cut off each year and another allowed to grow in its place. The price of bark in 1920 was 10 cents per pound.

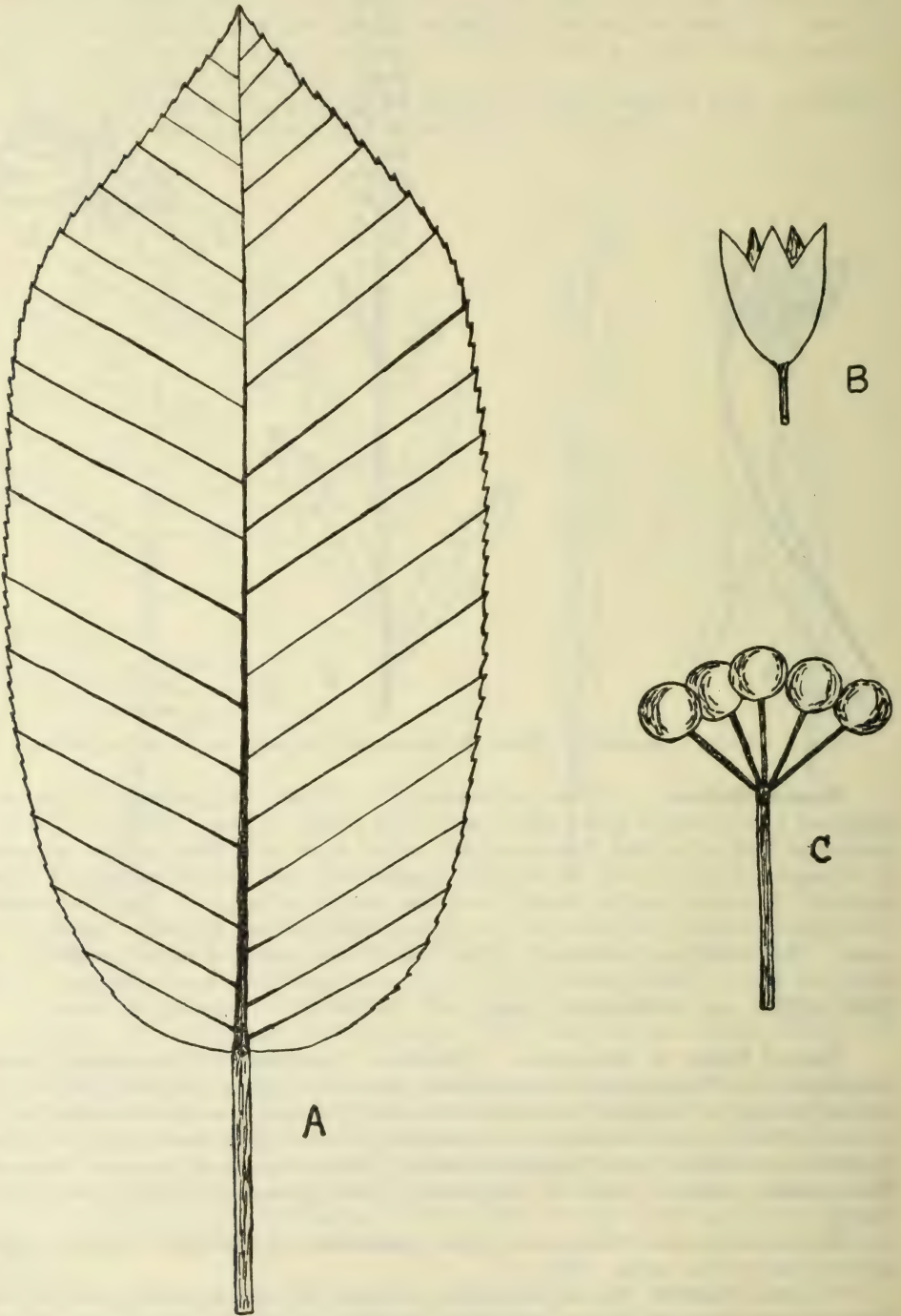


Fig. 5.—Sacred Bark: A, Leaf; B, Calyx; C, Fruits.



**Anise.** *Pimpinella Anisum* L. (Fam. UMBELLIFERAE). The dried ripe fruits yield *Anisum* (U.S.) and *Anisi fructus* (B.P.) and are imported from Mediterranean countries and Russia. It is an annual plant, and should be capable of cultivation in some districts of Canada.

The seeds should be sown early and covered lightly. The crop should be harvested as soon as the tips of the fruit turn a grayish-green colour. From 400 to 600 pounds of seeds per acre have been obtained. The price in 1920 ranged from 20 to 30 cents per pound.

**Caraway.** *Carum Carui* L. (Fam. UMBELLIFERAE). The dried, nearly ripe fruit furnishes *Carum* (U.S.) and *Carui Fructus* (B.P.).

Biennial herbs, 1 to 2 feet high, with hollow stem. Leaves alternate, pinnately divided into narrow segments, with a sheathing base. Inflorescence, a compound umbel. There are no bracts below the simple umbel. Flowers, white. Sepals very small, petals 5, separate, stamens 5. Fruit oblong, about one-sixth inch long, ribbed, separating into two one-seeded pieces when ripe. Flowers May-July.

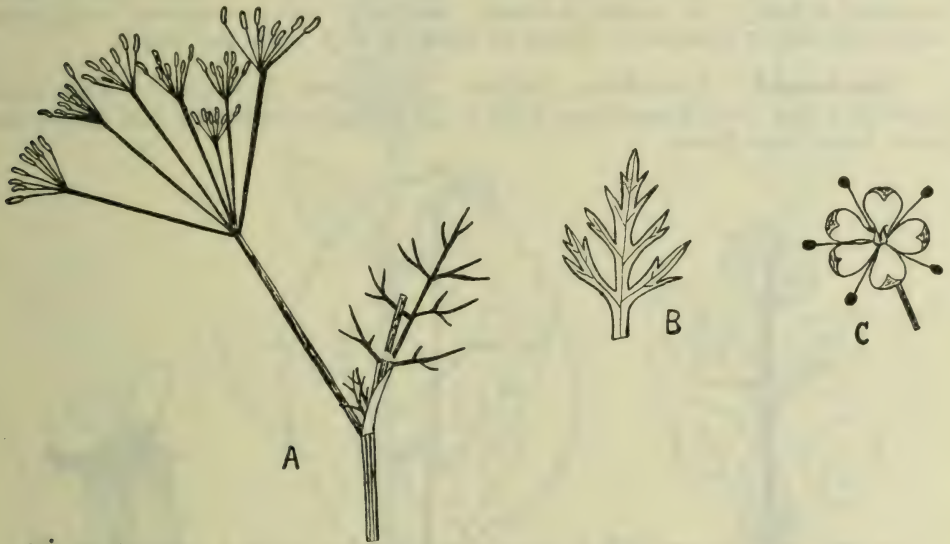


Fig. 6.—Caraway: A, Upper leaf and fruiting umbel; B, Part of lower leaf; C, Flower.

A native of Europe, but has escaped from cultivation and occurs on waste ground in Eastern Canada. (Fig. 6).

The seeds may be sown in drills about 16 inches apart, about 7 pounds of seed being used per acre. Cultivation will be necessary to keep down weeds. The crop should be cut as soon as the first seeds ripen. About 1,000 pounds of seed per acre may be produced. The average price has been about 9 cents per pound.

**Coriander.** *Coriandrum sativum* L. (Fam. UMBELLIFERAE). The dried ripe fruit yields *Coriandrum* (U.S.) and *Coriandri fructus* (B.P.). The seed of this plant, which is an annual species, should be sown in rows, 18 inches apart if hand cultivation is to be practised. About 500 pounds of seed or more per acre may be obtained. The price in 1920 was 3 to 4 cents per pound.

**Dill.** *Peucedanum graveolens* Benth. and Hook. f. (Fam. UMBELLIFERAE.) The dried ripe fruit yields *Anethi fructus* (B.P.). It is an annual species. It should be sown early, in rows 15 to 18 inches apart. About 500 pounds of seed or more per acre may be obtained. The price in 1920 varied from 8 to 11 cents per pound.



**Fennel.** *Foeniculum vulgare* Mill. (Fam. UMBELLIFERAE.) The dried ripe fruits yield *Foeniculum* (U.S.) and *Foeniculi fructus* (B.P.). It is a native of countries around the Mediterranean, but has been grown as far north as Connecticut. It would probably succeed in Southern Ontario or British Columbia. It is an annual or perennial herb according to the climate, with very finely-divided leaves, and is adapted to dry and sunny situations. From  $4\frac{1}{2}$  to 5 pounds of seed should be sown per acre. It should be cut before the seeds are fully ripe.

A yield of 600 to 800 pounds of seed may be obtained. The price in 1920 was 11 to 12 cents per pound.

**Wintergreen or Checkerberry.** *Gaultheria procumbens* L. (Fam. ERICACEAE.) The dried leaves yield *Oleum Gaultheriae* (U.S.). They should be collected in autumn.

Small aromatic shrubs 2 to 6 inches high, with creeping stems. Leaves mostly clustered at the tips of the branches, oval, with a white, drooping flower between the leaf and the stem. Fruit enclosed in the red fleshy calyx, which resembles a berry. It occurs in woods, especially under evergreen trees, from Newfoundland to Manitoba. Price of leaves 4 to 5 cents per pound.

**Horehound.** *Marrubium vulgare*. L. (Fam. LABIATAE.) The dried leaves and tops yield *Marrubium* (U.S.). It should be collected just before the plant comes into flower.

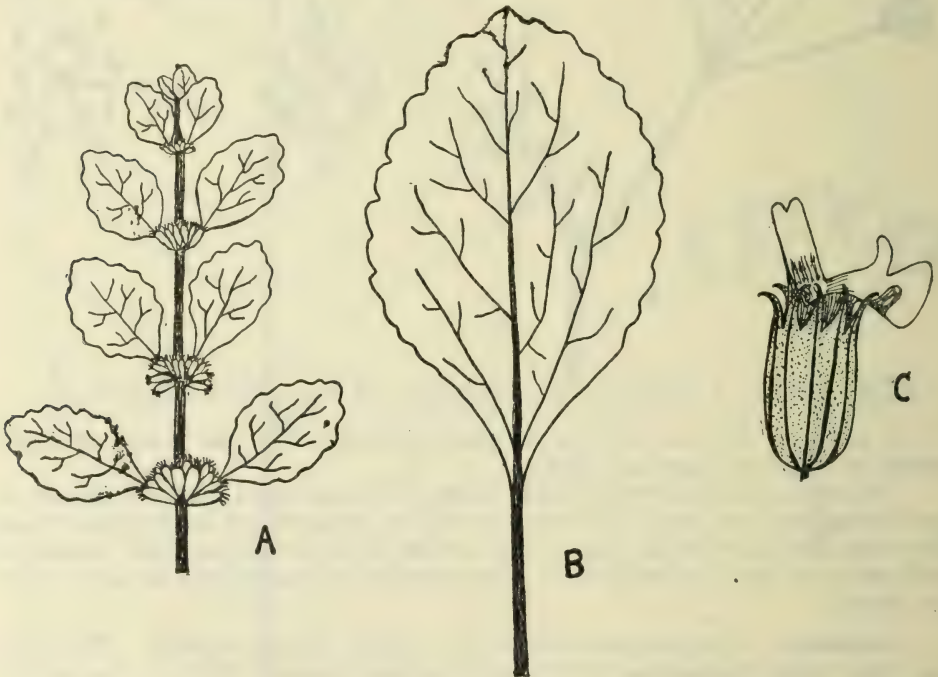


Fig. 7.—Horehound: A, Stem and inflorescence; B, Leaf; C, Flower.

Perennial herbs 1 to 3 feet high, strongly scented, covered with white woolly hairs. Leaves opposite, rounded to ovate, wrinkled, bluntly toothed, 1 to 2 inches long. Flowers in clusters above the attachment of the leaves, white. Calyx teeth, ten in number, curved outwards. Corolla two-lipped. Stamens 4. Fruit separating into four one-seeded pieces. Flowers June-August. A native of Europe, but has escaped from cultivation on to waste ground in Ontario and British Columbia. (Fig. 7.)



After cutting, the plants should be dried in the shade so as to preserve the colour. About a ton of dry herb can be obtained per acre. Price in 1920 was 15 to 16 cents per pound.

**Peppermint.** *Mentha Piperita* L. (Fam. LABIATAE.) The dried leaves and flowering tops yield *Mentha Piperita* (U.S.), *Oleum Menthae Piperitae* (U.S. and B.P.), and *Menthol* (U.S. and B.P.). It is collected at the commencement of flowering. Strongly scented perennial herbs, 1 to 3 feet high, with creeping underground stems. Leaves opposite, lance-shaped,  $1\frac{1}{2}$  to 3 inches long, toothed, with short stalks. Flowers in dense clusters, forming a central spike at the top of the stem, and two lateral spikes, which equal it in length, pale purple in colour. Calyx 5-toothed, corolla 2-lipped, stamens 4, equal in length. Fruit separating into 4 one-seeded pieces. Flowers July-September. (Fig. 8).

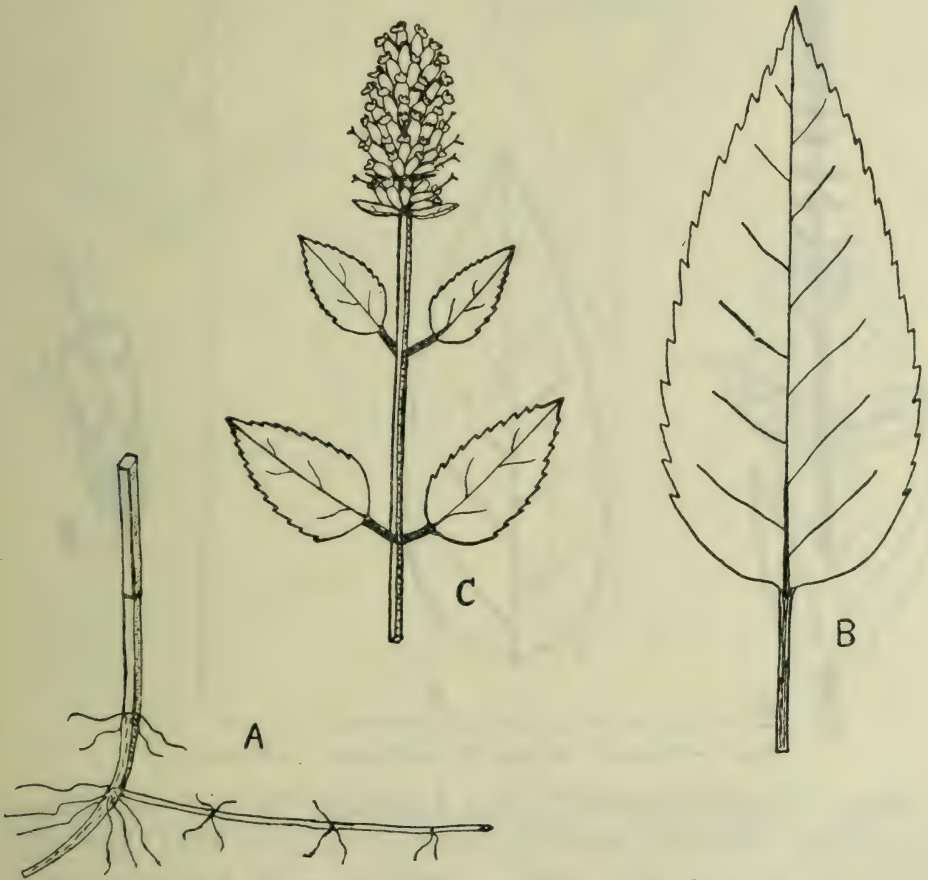


Fig. 8.—Peppermint: A, Rhizome; B, Leaf; C, Inflorescence.

A native of Europe, but has escaped from cultivation and occurs in wet ground from Nova Scotia to Ontario. Peppermint grows best on muck lands.

It is propagated by runners which should be planted in furrows about 3 feet apart and covered lightly. It is cut and dried like ordinary hay and yields from one to one and a half tons of dried herb per acre. The yield of oil varies from 25 to 80 pounds per acre, from 30 to 40 pounds being the average. The price of the dried herb varies from 6 to 15 cents per pound while the price of oil has fluctuated during ten years between \$1.10 and \$3.50 per pound.

**Spearmint.** *Mentha spicata* L. (*Mentha viridis* L.) (Fam. LABIATAE.) The dried leaves and flowering tops yield *Mentha Viridis* (U.S.) and *Oleum Menthae Viridis* (U.S. and B.P.). It should be collected just before the flowers open. It resembles *Mentha piperita*, but differs in the following characters: The height is 1 to 1½ feet, the leaves are without stalks, the central spike is taller than the two lateral ones, and the flower clusters are arranged more loosely, with a short interval between them. It is a native of Europe, but has escaped from cultivation and grows in wet grounds from Nova Scotia to Ontario. (Fig. 9).

The method of cultivation and harvesting is the same as for Peppermint. The yield per acre is about the same as in the case of Peppermint. The price of the dried herb in 1920 was 6 to 12 cents per pound while the price of the oil was \$12 per pound. There is however, much less demand for Spearmint than for Peppermint.

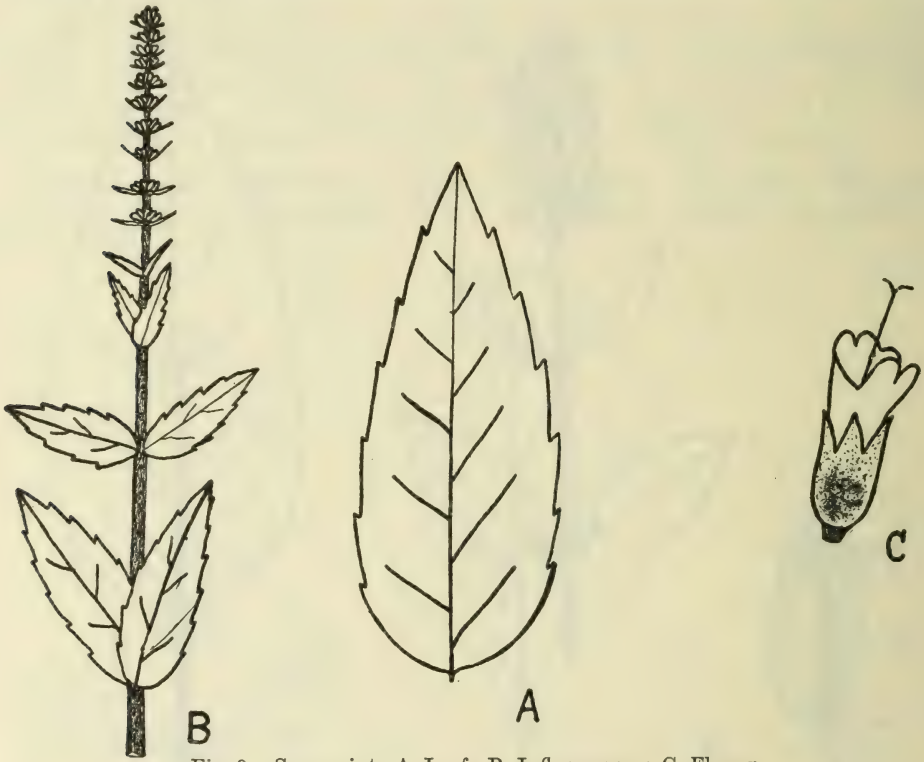


Fig. 9.—Spearmint: A, Leaf; B, Inflorescence; C, Flower.

**Thyme.** *Thymus vulgaris* L. (Fam. LABIATAE). The herb, cut and dried when in flower, yields after distillation *Oleum Thymi* (U.S.) and *Thymol* (U.S. and B.P.).

It is a small, somewhat shrubby, perennial plant found in Europe and Asia. It can be propagated either from seeds or cuttings rooted in sand. It should be planted in rows 18 inches to 2 feet apart. As much as a ton of dry herb per acre may be obtained but this is above the average. The price in 1920 was 11 to 15 cents per pound.

**Deadly Nightshade or Belladonna.** *Atropa Belladonna* L. (Fam. SOLANACEAE). The dried leaves yield *Belladonnae folia* (U.S. and B.P.), and the dried roots *Belladonnae radix* (U.S. and B.P.) The leaves should be collected when the plant is in flower, the root in the autumn, when about three or four years old. It is a perennial herb, with purple, bell-shaped flowers and dark



purple berries, and is poisonous. It grows well in good garden soil, especially if limy. It has been cultivated successfully in the warmer parts of Canada. Seed should be sown in a specially prepared seed-bed in autumn, as it is found that frost accelerates germination.

The young plants should be set 18 inches apart in rows  $2\frac{1}{2}$  feet distant from each other. About 600 pounds of dried leaves and 160 pounds of dried root per acre may be obtained. Price of leaves in 1920 was 30 to 35 cents per pound and of roots 55 cents per pound.

**Thornapple or Jimson Weed.** *Datura Stramonium* L. (Fam. SOLANACEAE). The dried leaves yield *Stramonium* (U.S.) and *Stramonii folia* (B.P.). The leaves are collected when the plant is in flower.

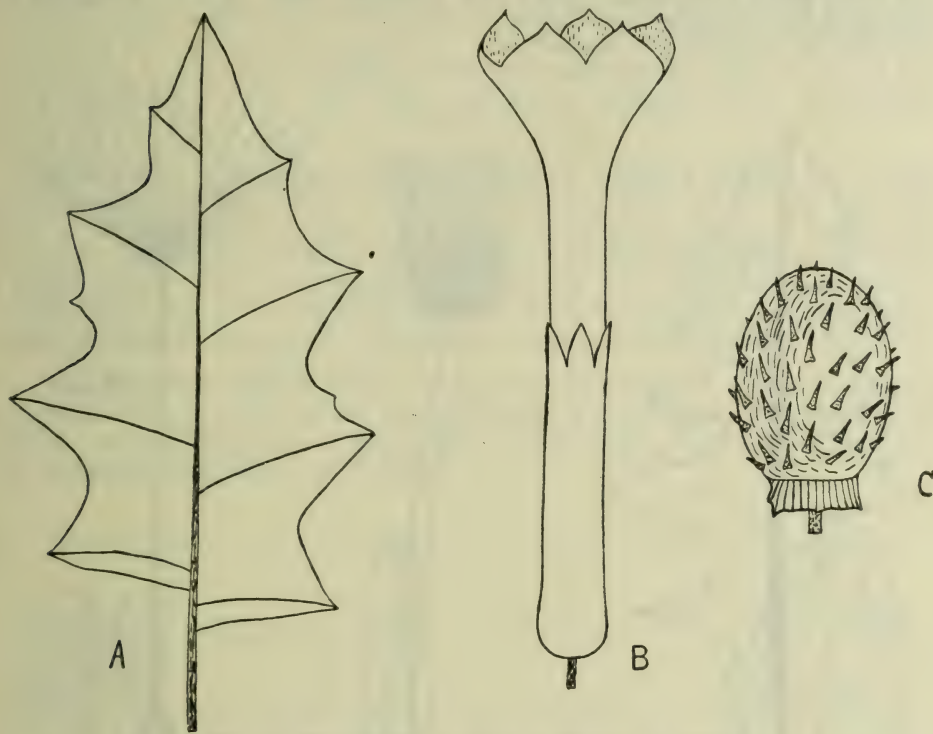


Fig. 10.—Thornapple: A, Leaf; B, Flower; C, Fruit.

Annual, strong-smelling herbs, 1 to 5 feet high, smooth. Leaves ovate, 3 to 8 inches long, deeply and irregularly toothed. Flowers borne singly in the forks, large, white in colour. Calyx tubular, angled, with five teeth. Corolla funnel-shaped, five-lobed. Stamens 5. Capsule about 2 inches long, covered with prickles. Flowers June-September. A native of Asia but has escaped from cultivation and occurs on waste ground from Nova Scotia to Ontario. Poisonous. (Fig. 10.)

The easiest way to handle it is to cut it close to the ground when in flower and dry it in a tobacco-curing shed at a temperature of  $100^{\circ}$ - $110^{\circ}$  F. When the leaves are dry they may be easily stripped off.

It grows best in limy soils. The seed should be sown in rows 3 feet apart. The plants should be thinned to stand 12 inches apart in each row. The yield of dry leaves varies from 1,000 to 1,500 pounds per acre. Price of leaves in 1920 was 22 cents per pound.

**Garden Chamomile.** *Anthemis nobilis* L. (Fam. COMPOSITAE). The dried flower heads of cultivated plants yield the drug *Anthemis* (U.S.) and *Anthemidis flores* (B.P.). It should be collected just when the flower heads open. It is a perennial herb, with white double flowers, native of England and Europe in pastures and dry soils. It is hardy at the Central Experimental Farm, Ottawa. It is propagated usually by dividing an old plant into ten to twelve parts or "sets," which are planted in rows  $2\frac{1}{2}$  feet apart, with 18 inches between the plants in the row. If propagated from seed, some of the plants may have "single" flowers, but those with double flowers are preferred.

The yield of dried flowers is about 400 to 600 pounds per acre. The price in 1920 was 18 to 20 cents per pound.

**Dandelion.** *Taraxacum officinale* Weber. (Fam. CICHORIACEAE). The dried roots yield *Taraxacum* (U.S.) and *Taraxaci radix* (B.P.). It should be collected in the autumn.

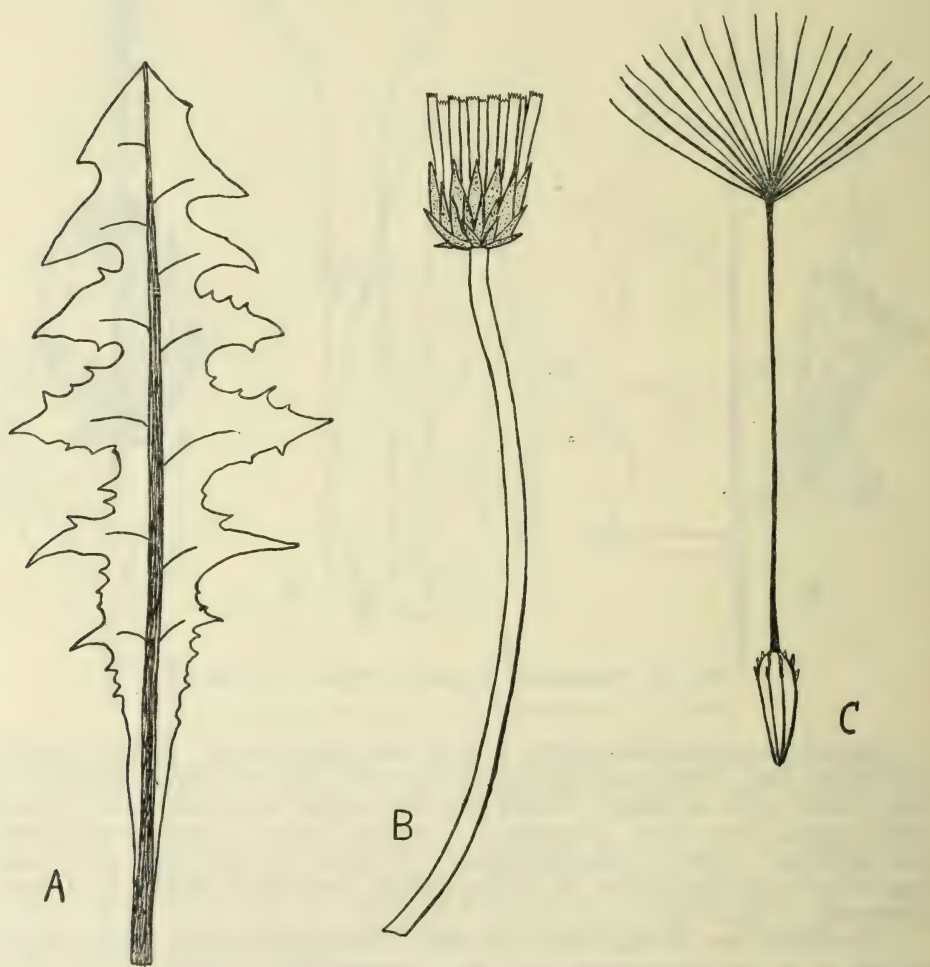


Fig. 11.—Dandelion: A, Leaf; B, Flower-head; C, Fruit.

Perennial herbs with a thick, fleshy root sometimes a foot long, containing milky juice. Leaves all on the surface of the ground, pinnately lobed and toothed along the sides, 3 to 10 inches long. Flowers yellow, in heads, borne on



a leafless, unbranched stalk 8 to 18 inches high. Fruit with a long, narrow beak and a tuft of hairs at the top, one-seeded and indehiscent. Flowers January-December. A European species, but is now a common weed in all parts of Canada. (Fig. 11.)

Seeds should be sown in rows 18 inches apart, the plants in the row being 12 inches apart. The roots are large enough for sale at the end of the second season. A yield of 1,000 to 1,500 pounds of dry roots per acre may be obtained. The price in 1920 was 16 cents per pound.

## CHAPTER VI

### Medicinal Plants used in moderate or small quantities

The plants mentioned below either occur wild in Canada or have been introduced and now spread spontaneously. The demand for these is comparatively small and it is extremely doubtful whether it would pay to cultivate any of them on a considerable scale. Only those species are included which are official in either the British or United States Pharmacopœia.

**Male Fern.** *Dryopteris Filix-mas* Schott (*Aspidium Filix-mas* Sw.) (Fam. POLYPODIACEAE). The dried rhizome yields *Aspidium* (U.S.) and *Filix Mas* (B.P.). It should be collected from July to September, all brown scales, roots, and dead parts being removed, and only those parts being retained which have a green colour. The leaves are pinnately divided, are 1 to 3½ feet long, and bear on the under side of the segments, not far from the principal vein, the kidney-shaped groups of spore-cases. It occurs in rocky woods throughout Canada.

**The Marginal Shield Fern.** *Dryopteris marginalis* A. Gray. (*Aspidium marginale* Sw.) is used for the same purpose in the United States and is also official. It has the groups of spore-cases at the margin of the leaf-segments and has a similar distribution in Canada.

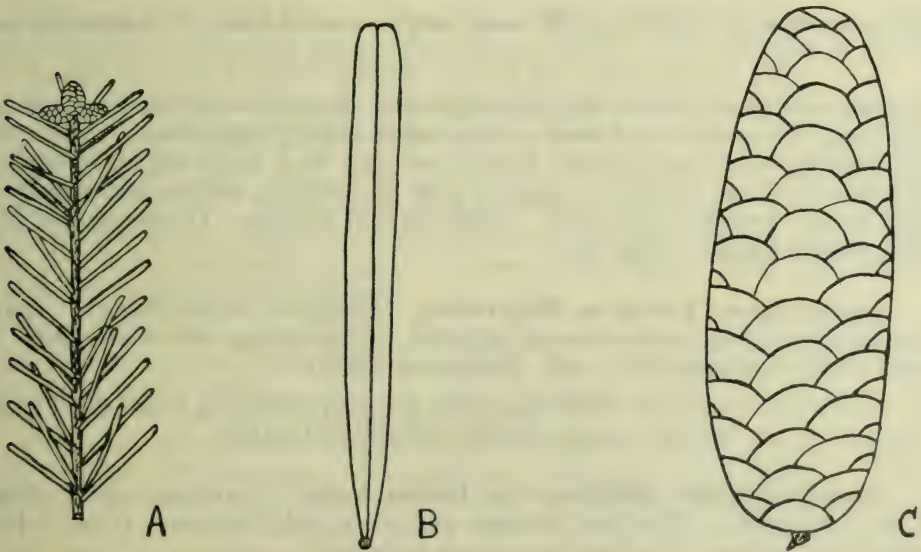


Fig. 12.—Balsam Fir: A, Leafy Branch; B, Single leaf; C, Seed-bearing cone.

**Balsam Fir.** *Abies balsamea* Mill. (Fam. PINACEAE). The resinous exudation from the trunk yields Canada Balsam—*Terebinthina Canadensis* (B.P.).

A forest evergreen tree with a maximum height of about 90 feet or, at higher elevations, a shrub, containing a resinous secretion in the trunk. Leaves alternate, apparently arranged in two rows, flattened, narrow, sessile, with the mid-rib prominent on the whitened lower surface, fragrant and persistent on drying, one-third to three-quarter inch long. Staminate cones in the angle between the leaf and stem, with powdery pollen. Seed-bearing cones at first violet, 2 to 4 inches long, when mature, erect, cylindrical. The scales are in pairs, the outer being the shorter, and both kinds fall off when mature from the central axis. Flowers May-June. A native of Canada from Labrador to Hudson Bay and Alberta. (Fig. 12.).

**Juniper.** *Juniperus communis* L. (Fam. PINACEAE). The dried, ripe, berry-like cones yield *Oleum Juniperi* (U.S. and B.P.). Evergreen trees, sometimes attaining a height of 30 feet, or shrubs, with the bark in shreds. Leaves

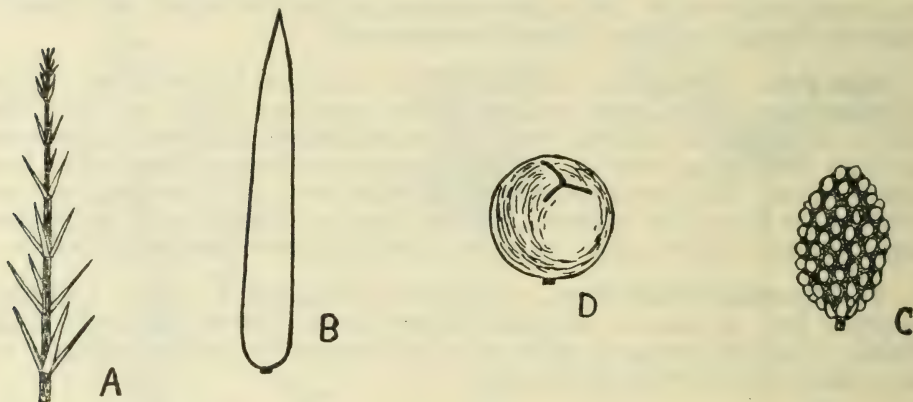


Fig. 13.—Juniper: A, Leafy branch; B, Single leaf; C, Staminate cone; D, Seed-bearing cone.

in groups of three, narrow and sharp-pointed, about one-half to three-quarter inch long. Staminate and seed-bearing cones usually on different trees. The seed-bearing cones are globular when ripe, with very short stalks. They are dark blue in colour, about one-quarter inch in diameter, and contain three very hard seeds. Flowers April-May. Cones ripe in October. Occurs on dry hills throughout Canada. (Fig. 13).

**Couch Grass, Twitch or Dog Grass.** *Agropyron repens* Beauv. (Fam. GRAMINEAE.) The dried rhizome collected in the spring and deprived of its roots yields *Triticum* (U.S.) and *Agropyrum* (B.P.).

A common weed 1 to 3 feet high with greenish flowers in a two-sided spike, a native of Europe but now occurring throughout Canada.

**American White Hellebore or Indian Poke.** *Veratrum viride* Aiton. (Fam. LILIACEAE). The dried rhizome and roots yield *Veratrum* (U.S.). It is collected in autumn after the leaves have withered.

Perennial herbs with short, thick, underground stem and coarse fibrous roots. Leafy stem 2 to 8 feet high. Leaves alternate, broadly oval, clasping at the base, 6 to 12 inches long with several prominent veins. Flowers yellowish green,



numerous, in a branching inflorescence. Sepals 3, petals 3, stamens 6. Fruit a 3-celled capsule. Flowers May-July. Poisonous. (Fig. 14). It occurs in swamps and wet woods from New Brunswick to British Columbia.

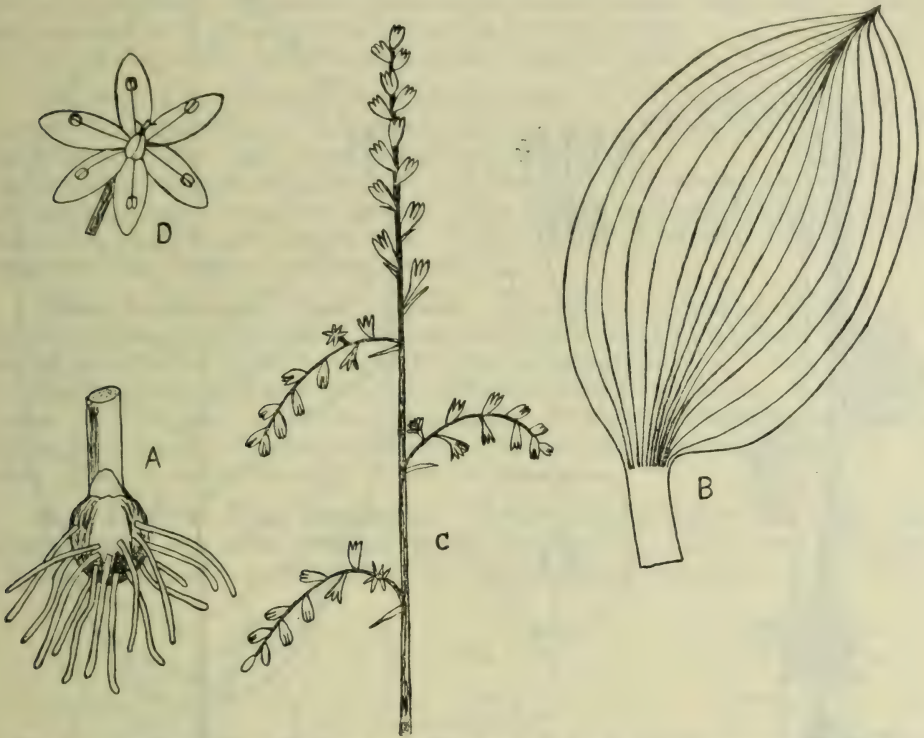


Fig. 14.—American White Hellebore: A, Rhizome; B, Leaf; C, Inflorescence; D, Flower.

**Slippery Elm, Red Elm.** *Ulmus fulva* Mich. (Fam. ULMACEAE). The bark, deprived of its outer part, yields *Ulmus* (U.S.) It is collected in spring and is generally dried under pressure, so that the pieces remain flat.

A large tree, with fragrant bark, the inner part of which is mucilaginous. The young twigs are covered with rough hairs. Leaves alternate, doubly toothed, unequal at the base, 4 to 8 inches long, fragrant on drying, shortly stalked. The stipules fall off early. Flowers in small clusters produced before the leaves. There is no corolla. Stamens, 5 or more. The fruit is one-seeded, with a broad membraneous wing surrounding the seed. The wing is not fringed with hairs as it is in other species of Elm. Flowers March-April. (Fig. 15.) Found in rich soil in Ontario and Quebec.

**Hop.** *Humulus Lupulus* L. (Fam. CANNABINACEAE). The dried carpellary flower-clusters yield *Humulus* (U.S.). The hops are picked when fully grown, but before ripening, and are very carefully dried. Artificial drying, under shade, by hot air yields the best results.

Perennial herbs with twining, prickly stems sometimes 25 feet long. Leaves opposite with three to seven lobes palmately arranged, and prominent united stipules. Staminate and carpellary flowers on different plants. Staminate flowers in a very much branched inflorescence. Each flower has a calyx, but no corolla, and five stamens. Carpellary flowers clustered, in drooping spikes, with large stipules and glandular bracts. When ripe, this inflorescence becomes cone-shaped, and is 1 to 2½ inches long. Flowers July-August. Fruit ripe, September-October. (Fig. 16). It occurs in thickets and on river banks from Nova Scotia to Manitoba.

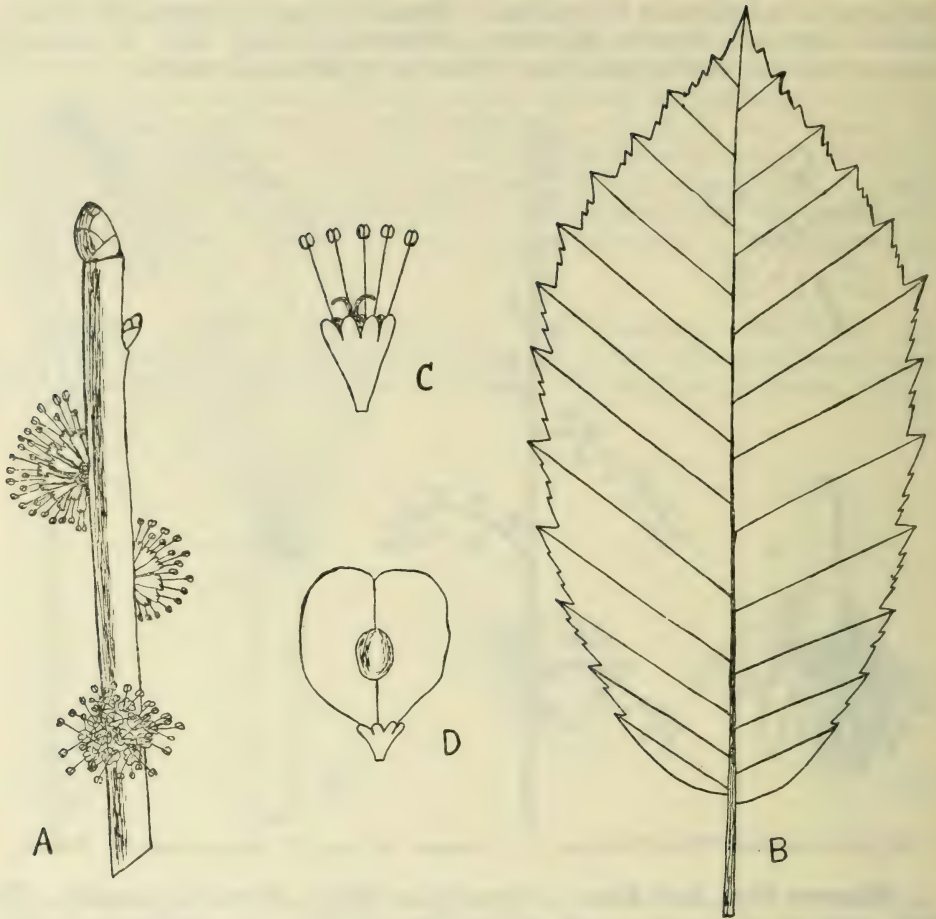


Fig. 15.—Slippery Elm: A, Branch in flower; B, Leaf; C, Flower; D, Fruit.

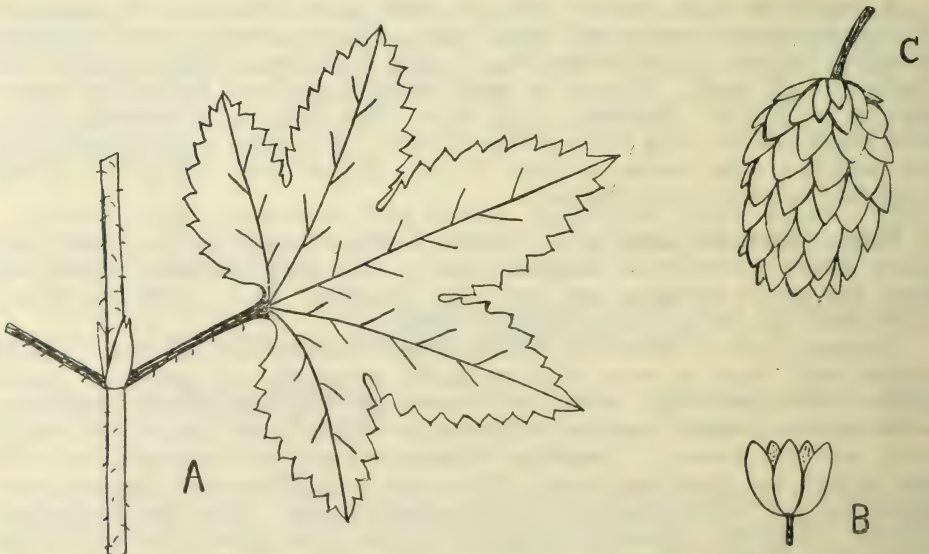


Fig. 16.—Hop: A, Stem and leaf; B, Calyx of staminate flower; C, Cluster of Carpellary flowers.



In cultivation, plants with staminate flowers are excluded, as hops are preferred with unripened seeds. They are propagated by "sets" or cuttings taken below ground, and about 6 inches long. They require a deep porous soil, and an open sunny situation. Poles must be set around them nearly vertical and fastened at the top for the hop stems to twine round.

An average yield is 800 pounds of dry hops per acre.

**Mexican Tea.** *Chenopodium ambrosioides* L. (*C. anthelminticum* L.) (Fam. CHENOPODIACEAE). The dried ripe fruit yields *Oleum Chenopodii* (U.S.) but the fruit itself is also used though not official.

Annual strong-scented herbs, 2 to 3½ feet high, with ovate, alternate leaves, and greenish, small clustered flowers. The fruit is enclosed by the calyx and contains a single black shining seed. It is a native of tropical America, but is naturalized in Ontario on waste ground.

**Black Snakeroot, Black Cohosh.** *Cimicifuga racemosa* Nutt. (Fam. RANUNCULACEAE). The dried rhizome and roots yield *Cimicifuga* (U.S.). It should be collected after it ripens its fruit in September.

Perennial herbs, 3 to 8 feet high, with thick-knotted rhizomes and alternate leaves divided into mostly ovate segments. Flowers ill-smelling, in racemes, white, with numerous stamens. Fruit, several-seeded, splitting down one side when ripe. It occurs in rocky woods in Ontario.

**May Apple or Wild Mandrake.** *Podophyllum peltatum* L. (Fam. BERBERIDACEAE). The dried rhizome yields *Podophyllum* (U.S.) and *Podophylli Rhizoma* (B.P.). It is collected in the latter half of September or in October.

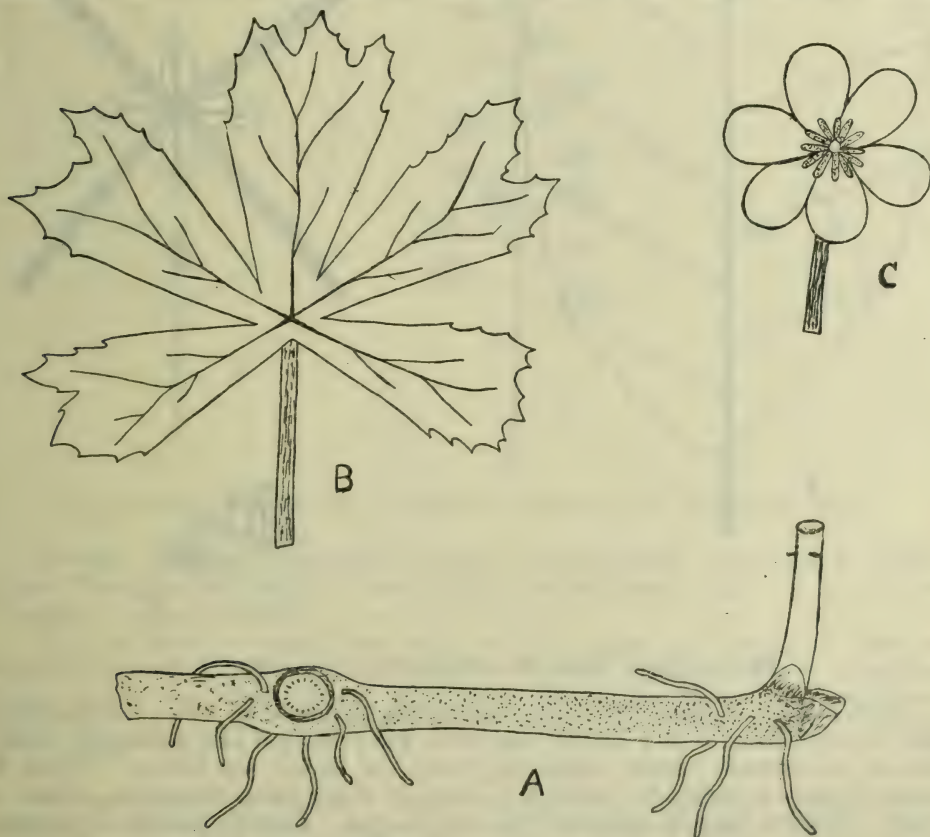


Fig. 17.—May-Apple: A, Rhizome; B, Leaf; C, Flower.

Perennial herbs with rhizomes and thick fibrous roots. Leafy stems 1 to 1½ feet high. Leaves with the veins radiating all round from the top of the stalk, palmately lobed, irregularly toothed at the apex, the lower leaves nearly a foot broad. Flowers solitary, white. Sepals 6, petals 6 to 9, separate, stamens twice as many as the petals. Fruit yellowish, ovoid, 1 to 2 inches long, edible. Flowers in May. The rhizome is poisonous. Native in woods in Quebec and Ontario. It prefers a heavy or alluvial soil and partly open exposure. (Fig. 17.)

**Bloodroot.** *Sanguinaria canadensis* L. (Fam. PAPAVERACEAE.) The dried rhizome yields *Sanguinaria* (U.S.). It should be collected after the death of the foliage in autumn.

Perennial herbs, with orange-red juice, palmately lobed leaves, solitary white flowers, and a capsule which splits when ripe down to the base into two halves. It occurs in rich woods from Nova Scotia to Manitoba.

**Witch Hazel.** *Hamamelis virginiana* L. (Fam. HAMAMELIDACEAE.) The bark and twigs yield *Hamamelidis Cortex* (U.S. and B.P.), and the dried leaves *Hamamelidis Folia* (U.S. and B.P.). The bark is collected in spring, and the leaves in autumn.

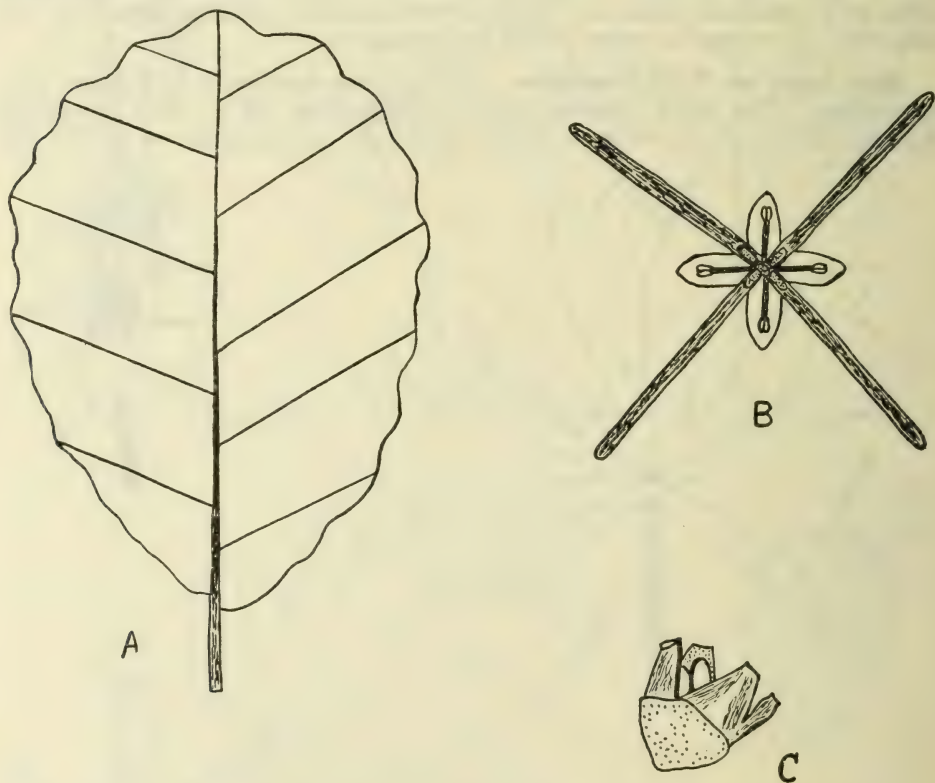


Fig. 18.—Witch Hazel: A, Leaf; B, Flower; C, Open Fruit.

It is a shrub or small tree with a maximum height of 25 feet. Leaves alternate, broadly oval, 2 to 5 inches long, with wavy margin and prominent veins. Flowers in clusters, yellow, appearing when the leaves are falling. Sepals 4, petals 4, narrow, separate, stamens 8, four of them being imperfect. Fruit a woody 2-seeded capsule, ripening the next season. Flowers August-December. Native in damp woods on rocky soil from New Brunswick to Ontario. (Fig. 18.)



**Wild Black Cherry or Rum Cherry.** *Prunus virginiana* Mill. (*Prunus serotina* Ehrh.) (Fam. ROSACEAE.) The bark collected in the autumn and dried yields *Prunus Virginiana* (U.S.) and *Pruni Virginianae Cortex* (B.P.).

A tree attaining a maximum height of 90 feet, with black bark. Leaves alternate, lance-shaped, toothed,  $2\frac{1}{2}$  to 4 inches long. Flowers in racemes, white. Sepals 5, petals 5, separate, stamens numerous. Fruit a globular drupe about one-third of an inch in diameter, dark-purple or black.

Flowers in May. Fruit ripe August-September. It occurs in woods from Nova Scotia to Ontario. (Fig. 19.)

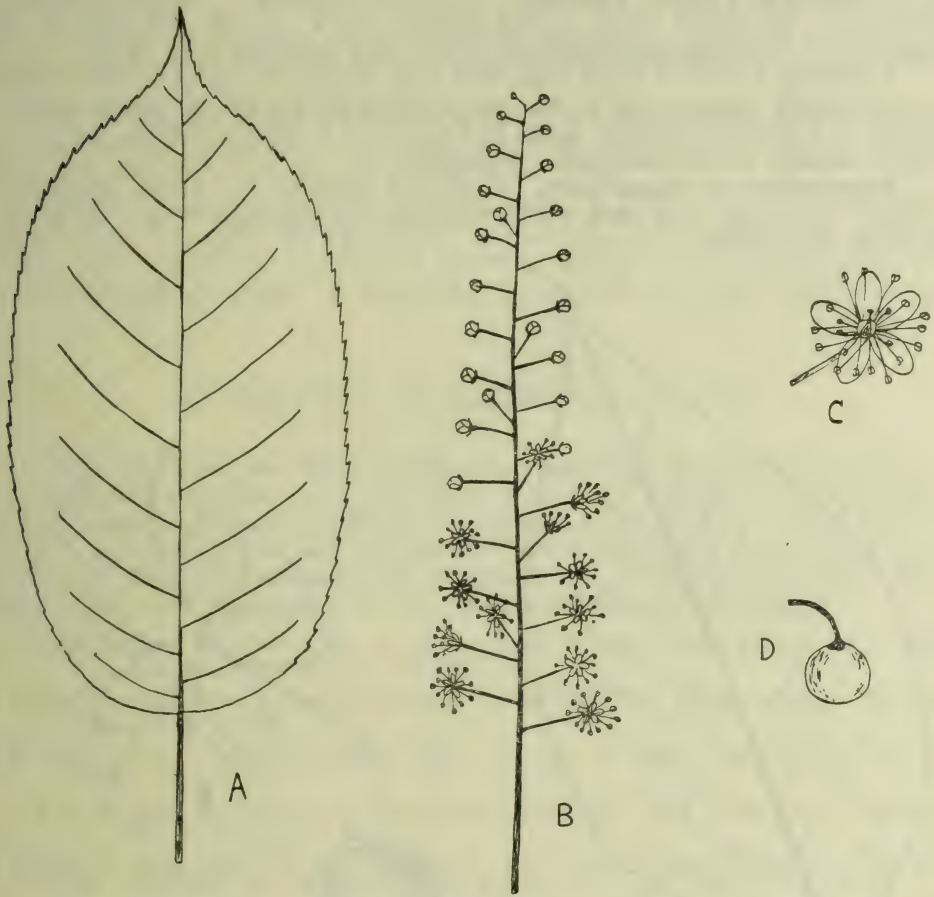


Fig. 19.—Wild Black Cherry: A, Leaf; B, Inflorescence; C, Flower; D, Fruit.

**Prickly Ash or Toothache Tree.** *Xanthoxylum americanum* Miller. (Fam. RUTACEAE.) The dried bark yields *Xanthoxylum* (U.S.) It is collected in autumn or early spring.

It is a shrub or small tree with prickly twigs and unequally pinnate, strongly-scented leaves with oil glands. Flowers greenish-yellow, appearing before the leaves. Fruit fleshy, opening by two valves when ripe, containing one or two black seeds. It occurs in rocky woods and on river banks in Quebec and Ontario.

**Burning Bush or Wahoo.** *Euonymus atropurpureus* Jacq. (Fam. CELASTRACEAE.) The dried bark of the root yields *Euonymi Cortex* (B.P.) It is collected in autumn or early spring.

A shrub or small tree with four-sided twigs and opposite leaves. Flowers dark purple. Fruit a four-lobed capsule, opening when ripe, to disclose the red seeds. It occurs in Ontario.

**Bearberry, Kinnikinnik.** *Arctostaphylos Uva-Ursi* Spreng. (Fam. ERICACEAE.) The dried leaves yield *Uva Ursi* (U.S.) and *Uvae Ursi folia* (B.P.) They are collected in autumn.

A trailing shrub with branches  $\frac{1}{2}$  to 2 feet long, and alternate, obovate, tough leaves. Flowers white in short racemes. Fruit a red drupe. It occurs in dry, sandy or rocky soil throughout Canada.

**Foxglove or Fairies' Thimbles.** *Digitalis purpurea* L. (Fam. SCROPHULARIACEAE.) The dried leaves of the second year's growth collected at the beginning of flowering yield *Digitalis* (U.S.) and *Digitalis folia* (B.P.)

A biennial herb, 2 to 5 feet high, with large purple, drooping, tubular flowers in a one-sided raceme, and 4 stamens. Native of Europe in sandy or stony ground, but occurs in various parts of Canada as a garden escape. In a wild state it usually avoids limy soils. Poisonous.

**Nannyberry or Sheepberry.** *Viburnum Lentago* L. (Fam. CAPRIFOLIACEAE.) The dried root bark yields *Viburnum prunifolium* (U.S.) It is collected in the autumn.

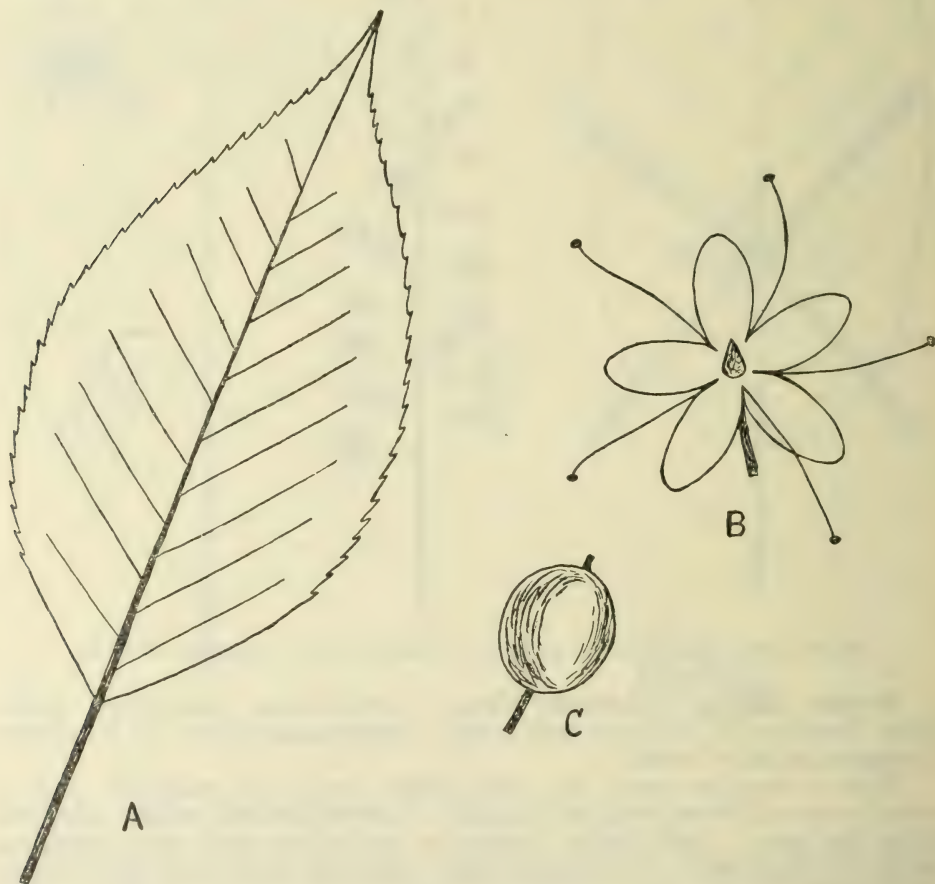


Fig. 20.—Nannyberry: A, Leaf; B, Flower; C, Fruit.

A shrub or small tree reaching a maximum height of 30 feet, with long, narrow winter buds. Leaves opposite, ovate, toothed, rather pointed, 2 to 4



inches long. Inflorescence branched, flat-topped, with several rays. Flowers white. Sepals, petals, and stamens 5, the petals being united. Fruit, an oval bluish-black drupe, nearly half an inch long, with flat stone. It occurs in rich soil in woods and banks of streams from Quebec to Manitoba. (Fig. 20.)

**Indian Tobacco.** *Lobelia inflata* L. (Fam. LOBELIACEAE). The dried leaves and tops yield *Lobelia* (U.S. and B.P.). They are collected after some of the fruits have ripened.

Annual herbs, with milky juice, 1 to 3 feet high, with alternate, ovate or lance-shaped leaves. Flowers in a raceme, light blue in colour, with two-lipped corolla split down the back. Capsule inflated when ripe. It occurs in fields and thickets on dry soil from Labrador to Ontario and Saskatchewan. Poisonous.

**Tar Weed, Broad-Leaved Gum Plant.** *Grindelia squarrosa* Dunal. (Fam. COMPOSITAE). The dried leaves and flowering tops yield *Grindelia* (U.S.). They are collected when the plant is in full bloom.

Smooth, perennial, aromatic herbs, 8 inches to 2 feet high, with alternate leaves which are spiny on the edges. Flowers in sticky heads with recurved bracts, both central and ray flowers yellow in colour. Fruit crowned with two or three bristles when ripe. It occurs in dry soil in Manitoba and Saskatchewan.

## LITERATURE ON MEDICINAL PLANTS

Those who wish for further information regarding the plants mentioned in this Bulletin, and also concerning other plants not included, will find much that is of service to them in the various publications listed below. Most of those marked with an asterisk can still be had, while the supply lasts, at the price mentioned, from the Superintendent of Documents, Government Printing Office, Washington, D.C., but stamps or coin should not be sent in payment—

1. True, Rodney H.—Cultivation of Drug Plants in the United States. (U.S. Dept. Agr. Year Book for 1903, pp. 337-346.)
- \* 2. Henkel, Alice.—Weeds used in Medicine. (U.S. Dept. Agr. Farmers' Bulletin No. 188, 1904.) Price 5 cents.
- \* 3. Henkel, Alice.—Peppermint (U.S. Dept. Agr. Bur. Pl. Indus. Bul. No. 90, Part III, 1905). Price 5 cents.
4. True, Rodney H.—Progress in Drug Plant Cultivation. (U.S. Dept. Agr. Year Book for 1905, pp. 533-540.)
- \* 5. Henkel, Alice.—Wild Medicinal Plants of the United States (U.S. Dept. Agr. Bur. Pl. Indus. Bul. No. 89, 1906). Price 5 cents.
- \* 6. Henkel, Alice.—American Root Drugs (U.S. Dept. Agr. Bur. Pl. Indus. Bul. No. 107, 1907). Price 15 cents.
- \* 7. Henkel, A., and Klugh, G. F.—The Cultivation and Handling of Golden Seal (U.S. Dept. Agr. Bur. Pl. Indus. Circ. No. 6, 1908). Price 5 cents.
- \* 8. Henkel, Alice.—American Medicinal Barks (U.S. Dept. Agr. Bur. Pl. Indus. Bul. No. 139, 1909). Price 15 cents.
- \* 9. Rabak, F.—The production of Volatile Oils and Perfumery Plants in the United States (U.S. Dept. Agr. Bur. Pl. Indus. Bul. No. 195, 1910). Price 10 cents.
- \* 10. Henkel, Alice.—American Medicinal Leaves and Herbs (U.S. Dept. Agr. Bur. Pl. Indus. Bul. No. 219, 1911). Price 15 cents.
11. Henkel, A.—The Cultivation of Medicinal Plants. (Drug Circ. 56, pp. 128-135, 1912.)
- \* 12. Henkel, A.—American Medicinal Flowers, Fruits, and Seeds (U.S. Dept. Agr. Bur. Pl. Indus. Bul. No. 26, 1913). Price 5 cents.
13. Fyles, F.—Golden Seal (Dom. Canada Exp. Farms Report for 1913, pp. 495-6).

14. Miller, F. A.—The Propagation of Medicinal Plants (Bul. Torrey Bot. Club, Vol. 41, No. 2, February, 1914, pp. 105-129).
- \*15. Van Fleet, Walter.—Golden Seal under Cultivation (U.S. Dept. Agr. Farmers' Bulletin No. 613, 1914). Price 5 cents.
16. Whatmough, W. A.—The Cultivation and Collection of Medicinal Plants in England (Journ. Board Agr. Vol. XXI, No. 6, pp. 492-510, September, 1914; also published separately as Leaflet No. 288, October, 1914).
17. The British Pharmacopoeia, London, 1914.
18. Denniston, R. H., and Kremers, R. E.—Medicinal Plants of Wisconsin (Rep. Director Pharmaceutical Exp. Sta. Univ. Wis., 1913-14. Madison, Wis., 1914).
- \*19. Van Fleet, W.—The Cultivation of Peppermint and Spearmint (U.S. Dept. Agr. Farmers' Bulletin No. 694. Washington, D.C., 1915). Price 5 cents.
- \*20. Hood, S. C.—Commercial Production of Thymol from Horsemint (*Monarda punctata*) (U.S. Dept. Agr. Bul. No. 372. Washington, D.C., 1916). Price 5 cents.
21. Rabak, F.—The Effect of Cultural and Climatic Conditions on the Yield and Quality of Peppermint Oil (U.S. Dept. Agr. Bul. No. 454. Washington, D.C., 1916). Price 5 cents.
22. Schneider, A.—The Cultivation of Belladonna in California (Agr. Exp. Sta. Bul. No. 275. Berkeley, Cal., 1916).
23. The Pharmacopoeia of the United States of America. Philadelphia, 1916.
24. Sayre, C. B.—Mint Growing in Northern Indiana (Purdue Univ. Agr. Exp. Sta. Circular No. 65. Lafayette, Ind., 1917).
25. Stockberger, W. W.—Production of Drug-Plant Crops in the United States (Year-book U.S. Dept. Agr. for 1917. Washington, D.C., 1918).
26. Fyles, F.—Principal Poisonous Plants of Canada (Dom. Can. Dept. Agr. Exp. Farms Br. Bul. S.S. 39. Ottawa, 1920).
- \*27. Russell, G. A.—Drying Crude Drugs (U.S. Dept. Agr. Farmers' Bulletin No. 1231. Washington, D.C., 1921). Price 5 cents.
- \*28. Stockberger, W. W.—Drug Plants under Cultivation (U.S. Dept. Agr. Farmers' Bulletin No. 663. Washington, D.C., 1922). Price 10 cents.
29. Davidson, J.—The Cascara Tree in British Columbia (Dept. Interior, Forestry Branch, Circular No. 11. Ottawa, 1922).
30. Davidson, J.—Commercial Drug-Plant Cultivation in British Columbia (Scientific Agriculture III: 285-289. April, 1923).



# INDEX TO PLANTS

	PAGE		PAGE
<i>Abies balsamea</i> .. . . .	19	Juniper.. . . .	20
<i>Agropyron repens</i> .. . . .	20	<i>Juniperus communis</i> .. . . .	20
<i>Althaea officinalis</i> .. . . .	11	Kinnikinnik.. . . .	26
Anise.. . . .	13	<i>Lobelia inflata</i> .. . . .	27
<i>Anthemis nobilis</i> .. . . .	18	Mallow, Marsh.. . . .	11
Apple, May.. . . .	23	Mandrake, Wild.. . . .	23
<i>Arctostaphylos Uva-Ursi</i> .. . . .	26	<i>Marrubium vulgare</i> .. . . .	14
Ash, prickly.. . . .	25	<i>Mentha piperita</i> .. . . .	15
<i>Aspidium Filix-Mas</i> .. . . .	19	<i>Mentha spicata</i> .. . . .	16
<i>Aspidium marginale</i> .. . . .	19	<i>Mentha viridis</i> .. . . .	16
<i>Atropa Belladonna</i> .. . . .	16	Mustard, Black.. . . .	10
Bark, sacred.. . . .	11	Mustard, White.. . . .	8
Bearberry.. . . .	11, 26	Nannyberry.. . . .	26
Belladonna.. . . .	16	Nightshade, Deadly.. . . .	16
Bloodroot.. . . .	24	Peppermint.. . . .	15
<i>Brassica nigra</i> .. . . .	10	<i>Peucedanum graveolens</i> .. . . .	13
Bush, Burning.. . . .	25	<i>Pimpinella Anisum</i> .. . . .	13
Caraway.. . . .	13	<i>Podophyllum peltatum</i> .. . . .	23
<i>Carum Carui</i> .. . . .	13	Poke, Indian.. . . .	20
Chamomile, Garden.. . . .	18	<i>Polygala Senega</i> .. . . .	10
Checkerberry.. . . .	14	<i>Prunus serotina</i> .. . . .	25
<i>Chenopodium ambrosioides</i> .. . . .	23	<i>Prunus virginiana</i> .. . . .	25
<i>Chenopodium anthelminticum</i> .. . . .	23	<i>Rhamnus Purshiana</i> .. . . .	11
Cherry, Rum.. . . .	25	<i>Sanguinaria canadensis</i> .. . . .	24
Cherry, Wild Black.. . . .	25	Seal, Golden.. . . .	8
<i>Cimicifuga racemosa</i> .. . . .	23	Sheepberry.. . . .	26
Cohosh, Black.. . . .	23	Shield-Fern, Marginal.. . . .	19
Coriander.. . . .	13	<i>Sinapis alba</i> .. . . .	8
<i>Coriandrum sativum</i> .. . . .	13	Snake-root, Black.. . . .	23
Dandelion.. . . .	18	Snake-root, Seneca.. . . .	10
<i>Datura Stramonium</i> .. . . .	17	Spearmint.. . . .	16
<i>Digitalis purpurea</i> .. . . .	26	<i>Taraxacum officinale</i> .. . . .	18
Dill.. . . .	13	Tea, Mexican.. . . .	23
<i>Dryopteris Filix-Mas</i> .. . . .	19	Thimbles, Fairies'.. . . .	26
<i>Dryopteris marginalis</i> .. . . .	19	Thornapple.. . . .	17
Elm, Red.. . . .	21	Thyme.. . . .	16
Elm, Slippery.. . . .	21	<i>Thymus vulgaris</i> .. . . .	16
<i>Euonymus atropurpureus</i> .. . . .	25	Tobacco, Indian.. . . .	27
Fennel.. . . .	14	Tree, Toothache.. . . .	25
Fern, Male.. . . .	19	Twitch.. . . .	20
Fir, Balsam.. . . .	19	<i>Ulmus fulva</i> .. . . .	21
Flax, Mountain.. . . .	10	<i>Veratrum viride</i> .. . . .	20
<i>Foeniculum vulgare</i> .. . . .	14	<i>Viburnum Lentago</i> .. . . .	26
Foxglove.. . . .	26	Wahoo.. . . .	25
<i>Gaultheria procumbens</i> .. . . .	14	Weed, Jimson.. . . .	17
Grass, Couch.. . . .	20	Weed, Tar.. . . .	27
Grass, Dog.. . . .	20	Wintergreen.. . . .	14
<i>Grindelia squarrosa</i> .. . . .	27	Witch-hazel.. . . .	24
Gum-plant, Broad-leaved.. . . .	27	<i>Xanthoxylum americanum</i> .. . . .	25
<i>Hamamelis virginiana</i> .. . . .	24		
Hellebore, American White.. . . .	20		
Hop.. . . .	21		
Horehound.. . . .	14		
<i>Humulus Lupulus</i> .. . . .	21		
<i>Hydrastis canadensis</i> .. . . .	8		











CAL/BCA OTTAWA K1A 0C5



3 9073 00215719 8



OTTAWA  
F. A. ACLAND  
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY  
1927